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EDUCATIONAL AIMS, IDEALS, AND ACTIVITIES

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Aims precede the curriculum. Alike in the organized writings of educators and in the changing conceptions of unorganized educational opinion, fundamental changes in the curriculum occur only after fundamental modifications of the aims of education have been discovered. Among the writers, Plato described the qualities of the perfect warrior guardian of the state before determining upon his education; Comenius presents the aims of virtue, piety, and learning before prescribing the curriculums of his systems of education; and Rousseau justifies his course of study by appeal to certain pre-formed assumptions concerning "the nature" of the child. Likewise, in the fluid movement of thought of the present generation when the curriculum of our times is in the making, we find that only after such aims as social efficiency have been subjected to prolonged discussion, do changes in the curriculum begin to occur.

This precedence of aims over subject matter is a necessity for purposes of selection and use. Because the information which youth inherits is beyond his powers of complete assimilation, selection must be made and a line must be drawn between the more useful and the less useful. And since selection is based upon value, educational aims must first be formulated. Moreover, since the functions of subject matter must be taught (for to present facts without an acquaintance with the uses to which they are to be put is futile) in the last analysis the use of any individual fact must be derived from the central aims of the whole system of education. So, for both selection and use the aims of education must precede the construction of the curriculum.

But though in all the educational classics, the writers have begun with the statement of aim, none has been able logically to derive an adequate curriculum from his aim. In every case there has been a mental leap from the aim to the subject matter, with no adequate principles to guide in the selection of material. This may seem to be a sweeping statement but a few illustrations will demonstrate its accuracy. In Plato's *Republic*, the author states his aim as follows: "Then in our judgment the man whose natural gifts promise to make him a perfect guardian of the state will be philosophical, high-spirited, swift-footed, and strong." Proceeding he says, "This then will be the original character of our guardians. But in what way shall we rear and educate them?" And answers his query as follows: "What then is the education to be? Perhaps we could hardly find a better than that which the experience of the past has already discovered, which consists, I believe, in gymnastics for the body, and music for the mind." He then proceeds to analyze gymnastics and music and argues for the inclusion of narratives, fables, and poetry in his course in music, which present certain proper ideals in the proper form, and of the proper types of melodies and songs. In his course in gymnastics he mentions little of the content but devotes his attention to the ideals of temperance, hardness, and health of body.

But this line of reasoning leaves much to be settled. Can the philosophical disposition be best trained through music? What parts of censored literature are to be selected? What gymnastic exercises are to be included in the curriculum? When the warrior has exercised in the gymnasium is he adequately trained for war or does he need some additional curriculum not mentioned by Plato?

This curriculum is not an adequate system of instruction for warriors. Within the last few years we have seen "a million men spring to arms," "high-spirited and strong," but they were not soldiers. Before they became the perfect guardians of the state their curriculum came to include much besides fables and poetry, melodies and songs. They had to learn to march, to shoot, to thrust with the bayonet, to fight in aeroplanes, and to sail the seas. Nor for the warriors of ancient Athens, who needed much specific training in the field and camp before they could perform

the acts of protection or aggression mentioned incidentally in the arguments of the *Republic*, was Plato's curriculum adequate.

The aims and curriculums of Comenius present the same insufficiency. This great educator assumes the aims of education to be to bring to maturity the seeds of learning, virtue, and piety implanted within us by nature. He then outlines his course for the vernacular school as follows (after Quick): "In this school the children should learn—first, to read and write the mother-tongue *well*, both with writing and printing letters; second, to compose grammatically; third, to cipher; fourth, to measure and weigh; fifth, to sing, at first popular airs, then from music; sixth, to say by heart sacred psalms and hymns; seventh, catechism, Bible history, and texts; eighth, moral rules with examples; ninth, economics and politics, as far as they could be understood; tenth, general history of the world; eleventh, figure of the earth and motion of the stars, etc., physics and geography, especially of native land; twelfth, general knowledge of arts and handicrafts."

Comenius sets up a threefold aim—learning, virtue, and piety. If we consider learning first, and ask whether it is possible to learn everything, the answer must be negative. Even though the Orbis Pictus was supposed to be a compendium of all knowledge, the compiler selected a few facts from the total mass. But when we ask for the basis of selection of facts no answer can be given. So far as the aim of learning is concerned with the selection it provides no criterion. Learning is learning and one fact is as good as another. If, however, we say that virtue and piety are the subsidiary aims which determine what facts should be learned we are still without a basis of selection. Will ciphering, or singing, or economics assist in any peculiarly valuable way to promote these two ends? Or, to carry the question further, what details of ciphering or economics will be most valuable in promoting virtue and piety? None, since one is as virtuous as another. Obviously, subject matter cannot be derived from learning of virtue and piety.

The impossibility of deriving subject matter from these aims is due to the fact that they are ideals isolated from activities. A virtuous carpenter does not perform the same actions, nor meet the same problems as a virtuous cook. A pious blacksmith receives a different education from that of a pious doctor. A virtuous and pious Chinaman thinks and acts on different matters

from those which engage the attention of a virtuous and pious American. The ideals are the same; the lives are widely different. It would be futile to teach a Chinaman the same curriculum as an American unless the intention were to Americanize him.

The curriculum is derived from both ideals and activities. Virtue, swift-footedness, piety, or social efficiency must be set up in a system of education; but in order to select the material to which these shall apply it is absolutely essential for the teacher to know the activities, problems, thoughts, or needs in connection with which these ideals are to operate.

Plato had a golden opportunity to set a new style in curriculum construction when he posited the perfect warrior as his ideal. If, instead of resting content with an enumeration of his qualities, he had analyzed the duties of the soldier, made what we call a job analysis, and had decided to teach swift-footedness, strength, high spirit, and the philosophic mind *through* these activities, he would have most profoundly influenced the education of two thousand years. But when he had stated his aim, he slipped back into the rut of the traditional subjects of his day as the best means of developing his aims. If, in like manner, Comenius had inquired into the activities of the French or English citizenry, had found out the important daily problems they had to meet and then had sought to make them virtuous and pious in their performance of these, he would have had a curriculum of demonstrable validity. He would then have known what ciphering, or economics, or political science, what music, sacred songs, and Biblical passages to learn. In other words, he would have been able to determine not only what subjects but what parts of subjects to include in his curriculum.

Ideals are both goals and standards. As goals, good taste, virtue, health, eloquence, and completeness of life are expressions of valuable ends for which men reach and whose attainment spells satisfaction. Discover the ideals of a nation and the trend of its action is known. As standards, ideals are arbiters of actions. One action may be discarded because it does not promote the ideals, while another may be accepted or modified because its performance leads toward the goals. But no man who sets ideals as goals is able to build his life in a vacuum and order his actions to suit his plans. He is born into a social group in situations over

which he has no original control. He is confronted by the actions of other men actuated by different ideals. Thrown into one situation he develops a set of actions different from those he would have had in another. With both his situation and his ideals in mind he is compelled to perform actions whose character is determined by both the ideals and the situation. Instead of possessing ideals and inventing a situation which will further them, it is more nearly accurate to say that he starts with situations and modifies them so as to realize his ideals as fully as circumstances will permit.

For this reason the curriculum by which he is trained to perform the important activities of the group in accordance with the highest ideals is necessarily based upon both activities and ideals. And obviously any aim of education expressed only in terms of ideals must fail to function.

Today the same procedure is necessary if the curriculum is to be modified intelligently. We suffer from the failure to distinguish between ideals and activities in the current aim of social efficiency. On some occasions we think of it as social efficiency, as an ideal in the sense that ideals of social service are advocated. But on other occasions we think of the activities carried on by those who are socially efficient, such activities as voting, beautification of the city, and the observance of community health regulations. And the result has been that only spasmodically and incompletely have we been able to modify the curriculum. What should be done by those who advocate social efficiency as the aim of education is to determine, first, the ideals of socially efficient individuals; second, the fundamental physical and mental activities carried on by people in the United States; and third, by a process of laborious analysis to discover exactly what important specific activities shall be taught and what ideals shall control in the performance of each. Until the objectives of education are broken up into these two elements it will be impossible to make an adequate reorganization.

AN EXPERIMENT IN PROMOTION[1]

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In the fall of 1918 the influenza epidemic badly disorganized the schools. It became evident that unless the usual exactions with reference to promotion were mitigated an unusually large number of children would fail of advancement. Perhaps because of this fact, the superintendents at Springfield, Illinois, and Decatur, Illinois, were more hospitable than would ordinarily have been the case to a proposal whose purpose was to increase the promotion rate.

The plan was simplicity itself.[2] It contemplated that each teacher toward the close of the semester should make the usual lists of pupils recommended for promotion and for failure; but that the pupils recommended for failure should be advanced to the next higher grade along with the pupils whose title to the next higher grade was clear. The plan further contemplated that the pupils who were thus advanced despite the teachers' recommendations for failure should be carried in the higher grade on probation and should be subjected to a regimen carefully devised and frequently checked up with a view to stimulating the pupils, the parents, and the teachers to increased effort.

This arrangement did not, however, contemplate 100 percent promotion. The pupils who were advanced on probation were not regarded as officially promoted until, as a result of the efforts made during the trial period, they had given evidence satisfactory to the teacher and the supervising officials of ability to maintain themselves and to profit by the work of the higher grade. Only under these circumstances was the promotion actually consummated.

The probationary period began with the first day of the new semester and lasted six weeks. During this period the receiving teacher kept for each probationary pupil a card on which was

[1] A paper presented at the meeting of the National Association of Directors of Educational Research at Atlantic City, N. J., March 3, 1921.

[2] It has been worked out in detail with experimental data by Mr. H. T. McKinney, a graduate student in education at the University of Illinois.

shown in the first place the record of the pupil in the previous semester and grade—i.e., the record which caused the sending teacher to recommend him for failure. In the second place, the receiving teacher indicated for each of the major subjects and for each week of the probationary period whether the pupil's work was satisfactory or unsatisfactory. Thus, at the end of the first week, the teacher indicated whether or not the reading had been satisfactory; whether or not the arithmetic had been satisfactory; and the same information as to language, geography, history, and spelling, so far as these subjects applied. The teacher also entered her best judgment as to whether the work as a whole—i.e., in all the subjects considered together—was satisfactory or unsatisfactory. Similar entries were made for the second, third, and successive weeks. At the end of the six-week period the measure of success or failure was fairly detailed.

In the third place, the receiving teacher recorded the efforts which she made to assist the pupil in maintaining himself in the higher grade. No little preparatory work was done in an experimental way in setting up this part of the record. A number of plans and devices for assisting pupils which had been found to work out in similar cases were considered. As a result we distinguished eight devices, and on these we asked the teacher to report which ones she used in the first week of the probationary period; which in the second week; which in the third week, and so on. The eight devices set up on the cards were: (1) visits to pupil's home; (2) other interviews with parents; (3) help outside of school hours; (4) varying the course of study; (5) varying the teaching method; (6) using pupil cooperation; (7) daily reports to parents; (8) sending home pupil's work. The teachers were furnished with considerable detail as to the use and proper value of each of these devices. Most of the devices, therefore, had a broader meaning to the people who were to use them than the mere naming of them implies.

For example, the device which I have called, "Daily reports to parents" was administered in two subordinate operations. It involved the provision of a small notebook of uniform size for all pupils concerned. It contemplated the entry by the teacher at the close of each day of an estimate of the work of the pupil for that day. The book containing this estimate, toge her with any

recommendations which the teacher might find advisable, was signed by the teacher and carried home by the pupil in the afternoon. As evidence that the parent had seen the report, the pupil was required to return the book the next morning with his parent's signature. In order to prevent the forging of signatures, teachers were advised to obtain on the first day of the probationary period *bona fide* signatures of all parents of probationary pupils. At this point I am tempted to digress to give evidence in support of the efficacy of this device. Both as a school man and as a parent, I know positively that even progressive schools are not realizing the tremendous possibility of systematic cooperation in the home. Even the best homes are surprisingly ignorant of what goes on in the school and of what pupils are expected to do. The steady pressure and sustaining influence of the home which is kept constantly and authoritatively informed is little realized by school people.

Finally, at the conclusion of the six-week probationary period the teacher was required to enter on the probationary card of each pupil her recommendation as to the retention of the pupil in the grade to which he had been advanced on probation. Provision was also made for the recommendation of the building principal on each card and for final action of the superintendent.

During the course of the probationary period arrangements were made for supervising the efforts of the teacher. The pupil's individual card containing, as we have said, the detailed scholastic standing and the notations as to devices used to aid the pupil, was kept filed in the office of the principal and was made available to supervisors and to the superintendent. In other words, the teacher did not retain the card and offer it for inspection when called for, but she kept it permanently filed in the principal's office, except when she needed it for the purpose of making entries upon it.

Let us now return to conditions as they were toward the close of the first semester of 1918–1919. The influenza and the Christmas vacation had just passed, and each had done its worst for the schools. Teachers at Decatur and Springfield, ignorant of the impending experiment in total promotion, were making up their lists of pupils recommended for failure. It was a long list aggregating at these two cities 1,276 pupils, exclusive of those in

the low first grade and the high eighth grade. After these lists had been made out and submitted to the superintendent, it was announced that all these children would be advanced to the grade to which they would have been promoted if they had not been recommended for failure. Accordingly, all the classes, except those in the grades mentioned, moved forward *en bloc*, each with a little group of probationers.

Observe that we have here a new emphasis in connection with the administrative problem of promotion. According to the plan which we are accustomed to follow, attention is centered upon the sending teacher. The promotion rate for each class is a matter of concern, but it has reference to the class as constituted at the close of the previous semester. Little heed is given to the receiving teacher. Very few principals or superintendents make her activities with reference to promoted pupils matters of record. Realizing no responsibility in connection with promotion, she not infrequently devotes some attention to trimming up the class which she has received. Pupils, if they are "difficult" and if they are old enough, drop out of school. We do not assert that the receiving teacher takes the initiative in inducing them to do this; but the measures she adopts to retain an undesirable pupil who is minded to leave school are likely to be feeble and ineffective. Again, the process of trimming up the class is effected by securing an occasional transfer of a pupil to some other class of the same grade either in the same building or elsewhere. Not infrequently the receiving teacher reports certain pupils for demotion, asserting that they have not been sufficiently well prepared and leaving it to be inferred that their promotion was secured through the undue liberality of the sending teacher. In fact, the sending teacher is often freely criticized by the receiving teacher. Not infrequently this criticism is outspoken and unprofessional.

When, however, the sending teacher has nothing to say about promotion further than to recommend probationary pupils; when promotion rates are made up on the basis of the number of children who maintain themselves in the grade to which they have been advanced; when, in short, it is the receiving teacher upon whom the spot light is turned and whose reputation is involved, we have automatically provided not only for a new emphasis but also for a new result.

At this point we should like to raise the question of the propriety of deciding upon the promotion or failure of a pupil in this way. The usual criterion of promotion is ability to "pass" the work of the previous grade. In other words, promotion to a given grade is dependent upon success in the work of the grade next below it. We believe that a higher law supervenes at this point. We believe that the decision as to promotion should rest upon a consideration of what the child needs to learn rather than upon what he has learned. The school exists for the child; the question of his classification is, in the highest sense, to be decided with reference to the adjustment which the school is thus permitted to make to his needs.

We have set up in our American schools a system of artificial grades. Having set it up, we have worshiped not its substance but its form; not the duty but the temple built by our own hands. We have blinded ourselves to the fact that the grades which we have created are only administrative devices intended to facilitate the handling of large groups of children. We have asserted the sequential character of these grades and maintained to the extent of denying the visible fact that children are often entirely capable of negotiating the course of study of one grade without having spent a year negotiating the course of study of the previous grade. We have ignored unquestioned evidence of the fact that grade lines cannot be sharply drawn; that the overlapping of one grade upon another is so extensive that in individual cases membership in a given grade fails to establish to a useful degree of accuracy what a child knows or what he can do.

One grade is really distinguished from another by differences in the course of study. Sometime these differences are very great. The difference, for example, between the sixth and seventh grades with respect to the teaching material is especially pronounced. The New York course of study (to take a particular instance) introduces a new history subject, two new continents in geography, and a course in elementary algebra, to say nothing of manual training and domestic science. It is our judgment that the promotion of children should take account of the extent to which they have been offered the course of study of a given grade, since it is by the course of study rather than by the attainments of pupils that one grade is most unequivocally distinguished from

another. It is proper that our promotion scheme should contemplate the advancement of pupils from one grade to another on the basis not of attainment but of the course of study; on the basis, in other words, of the course of study to which they have been subjected and the course which lies adjacent to it. There is plenty of evidence to show that causing a child to repeat the work of a grade may cause no improvement in his work, although it is done with the abiding faith that improvement will take place. Under these circumstances, it is a hazardous undertaking—an undertaking which it is difficult to justify—to deny a pupil of, let us say, the sixth grade, the opportunity to profit by the richer curriculum of the seventh grade.

I have already stated that 1,276 pupils from the high second through the high seventh grades were advanced on probation at Springfield and Decatur at the close of the first semester of 1918–1919. All these pupils would have failed in the ordinary course of events. As a result of the work done during the probationary period, however, something over three-quarters of them maintained themselves in the grade to which they had been provisionally advanced. By this means the promotion rate for these two cities was raised to about 95 percent.

During the second semester of 1918–1919—the semester at the beginning of which the probationary period had occurred—the superintendents of Decatur and Springfield obtained from their teachers opinions concerning this promotion scheme. Superintendent Allen of Springfield secured an unsigned vote of the teachers in which they indicated whether in their judgment the experiment ought to be continued another semester. The vote was almost unanimous for continuing it. Accordingly, the identical procedure which had taken place in January was repeated in June. This time 881 pupils who would ordinarily have failed were provisionally promoted. This was only about two-thirds as many as had been so promoted the semester before. The drop was largely accounted for by two circumstances; first, there was no epidemic during the second semester, and second, the second semester of any school year is, as all practical school people know, a better semester than the first. In a system having semi-annual promotions fewer children fail in June than in January.

The probationary period for these 881 pupils did not, of course, occur until the following September and October, that is until the fall of 1919. Again three-quarters of the children made good, and as there were fewer probationary pupils than before, the promotion rate was even higher than 95 percent.

Again it was decided to continue the experiment; and in January, 1920, the list of pupils promoted on trial consisted of 984 names. This time the probationary period resulted in the permanent promotion of only 60 percent of the pupils who were provisionally advanced. This drop in the rate was caused by the fact that during February and March an epidemic of measles, followed by whooping cough, was so severe as actually to close up some of the schools for about two weeks. This disturbance occurred during the probationary period. Some receiving teachers rightly felt that in many cases they had no foundation on which to base a recommendation for permanent promotion.

One would no doubt like to know to what extent the same pupils came up for probation one semester after another. If by this special process we are able to stimulate pupils so that they become acceptable as members of a higher grade, it is more than likely that by the time the next lists are made up they will again be found among the doubtful pupils. If such is the case, our promotion scheme will be continually addressed to much the same group of incompetent pupils, and the securing of their promotion will be a labor of Sisyphus.

It will be recalled that at the first probationary period 1,276 pupils were on trial. Only 172 of them came up for the same treatment at the close of the second semester. Of the same 1,276 pupils only 59 were placed on probation on all three of the occasions when this probation plan was used. Curiously enough, by no means all of these 59—indeed only about half of them—were found to be mentally deficient. Of the 1,276 who were first placed on probation only 76 came up for similar attention a year later—i.e., the third semester of our investigation. Or, to look at it in another way, of the original 1,276 probationers 1,087 did not become probationers on either of the two subsequent occasions. This represented more than 85 percent of the first probationary group. Similar statements could be made concerning the second group.

In many instances the receiving teacher and the sending teacher were the same person. In other words, the teacher went forward with the class. It has sometimes been urged that this kind of an arrangement will secure a higher promotion rate. Our data did not show this to be the case. There were in all 3,141 cases of advancement on trial. In exactly 1,100 of these cases, the teacher moved on with the class, while in 2,041, or practically twice as many cases, the teacher changed. In cases where the same teacher was involved 70.3 percent secured promotion. In cases involving a change of teacher 71.9 percent secured promotion. The result when the teacher moved forward with the class was, therefore, not quite as good as was the result when the teacher changed, although the difference was practically negligible.

One would also like to know the effect of this promotion scheme on scholarship. A drive of this sort might be expected, like most concerted efforts, to produce large results in the intended direction. The results, however, may be accompanied by compensating disadvantages. Comparing the scholarship of pupils during the probationary period with their scholarship at the beginning of the probation, we found that 74 percent of the pupils who consummated their promotion to the higher grade gained in scholarship; that 24 percent of them neither gained nor lost; and that only the remaining 2 percent lost ground. It would be natural to suppose, on the other hand, pupils who failed to secure promotion despite the efforts during the probationary period would show a loss in scholarship. A stationary condition, however, was the prevailing one for these pupils. The records stood at 9 percent gained, 7 percent lost, and 84 percent unchanged. Of the entire 3,141 probationary cases, 56 percent showed improvement in scholarship; 41 percent showed no change, and 3 percent showed a loss. It is a curious fact that most of the loss in scholarship occurred on the occasion of the first use of the total promotion plan, namely in February, 1919. The results expressed in terms of improvement in scholarship were appreciably better on the second and third trials of the experiment.

It may seem that a comparison of the scholarship as evinced during the probationary period with the scholarship shown at the beginning of it is unconvincing. More convincing would be

a statement of the broad general effect of the 95 percent promotion rate on the scholarship of all the pupils in all the grades. One might indeed expect and condone a small falling-off in the ratings of pupils. Grade standards are not the highest objectives in any school. They may be purchased far too dearly. The comparison of median grade scores with the norms of standard tests may lead to unfair conclusions. Not a few schools maintain high grade standards not because the pupils are either capable or well taught but because all but the most capable are held back and eliminated.

Be this as it may, the comparison of the scholarship records at Springfield and Decatur before the experiment and afterwards will be suggestive. Combining the percentage ratings of all the pupils in the elementary schools of these two cities, we find that the average for the semester ending in January, 1919, was 80.4. This was the result prior to the installation of the new plan of promotion. The corresponding figure for the semester ending June, 1919, was 81.4. This was after 75 percent of all the children who under ordinary circumstances would have been held back had been advanced to a higher grade. The figure denoting the average scholarship of all the pupils in both cities and for all subjects had not fallen. In fact, so far as there was a change, it had been in the direction of improvement—namely from 80.4 to 81.1.

A fuller effect of the new promotion plan, however, might be expected to be registered after two semesters—that is, after the schools had twice put the plan into effect. The average scholarship rating at the end of the second semester of the experiment was 82.2. Again the scholarship, as far as it was measured by the official school ratings, had not fallen. As a matter of fact, it had again risen slightly. To recapitulate: the three figures indicating the scholarship before the experiment, the scholarship after one semester of it and the scholarship after two semesters of it were 80.4, 81.1, and 82.2.

Our investigation covered a number of additional topics on which it would take too long to enlarge. Perhaps I ought, however, to allude to the analysis which we made of the causes of failure, or rather in this case, the causes of the recommendation for trial promotion. Since this recommendation for trial promo-

tion was primarily the same as the usual recommendations for failure, the causes, so far as they operated in this case, would have general significance. We recognized seven causes of failure, and I list them in the order of their frequency of mention by the teachers as operating causes, first being the most frequently mentioned: (1) wrong attitude toward the school; (2) mental defect; (3) irregular attendance; (4) poor home conditions; (5) physical defect; (6) changing from one school to another; (7) poor social conditions. When we try this experiment again, we shall more definitely relate the device to be used in the probationary period to these alleged causes of failure.

We realize that these causes are not mutually exclusive. There are those who assert that the fundamental cause is mental defect, and that wrong attitude, poor home conditions, changing from one school to another, irregular attendance, and poor social condition are attributable to a low level of intelligence either on the part of the pupil or on the part of the family. So far as the mental deficiency of the pupil is concerned, we have some, though by no means complete, evidence that the failure of pupils was neither exclusively nor to a very large extent due to it. I have already referred to the 59 pupils who were put on probation three times. It would seem that mental defect would be especially prevalent in this group. The results of our investigations, however, did not support this presumption. Not more than one-half of them could be pronounced defective.

Our experiment proved interesting even beyond our expectations. The value of such a method of promoting pupils cannot perhaps be determined from an application of it in two cities whose total elementary school enrollment does not exceed thirteen or fourteen thousand; but when the method is tried not once, but three times and when the results are so uniformly favorable, we feel that we are sufficiently modest if we maintain that it offers interesting and important possibilities in administration.

A CONSTRUCTIVE PROGRAM IN SILENT READING[1]

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The first step in a constructive program in silent reading is to mark out the objectives to be attacked. The material which we read silently falls into two large classes: that of a literary nature, read primarily for leisure purposes, and that of an informational character, read for the most part with a work attitude. While the abilities involved in the appreciation of literature are very significant, it seems wiser to classify them under the term *literature* and to develop them by special technics. At any rate, in this discussion the term *silent reading* will be used as a group name for those abilities which insure efficient work with books. The aims involved in this type of reading are more easily determined and more easily understood than in the case of literature, where the objectives are troublesome to mark out, the method of treatment hard to discover, and the results difficult to test. Certainly the standards for judging the two abilities are not the same. For example, it is by no means clear that it is always desirable to read literature rapidly. The individual who reads two stories in an hour does not benefit twice as much as he who reads but one in the same time. As a matter of fact, as in the case of poetry, it is often not even desirable to read literature silently at all.

Most of the tests and discussions of silent reading have emphasized two abilities, speed and comprehension. To these must be added two others, namely, the ability to organize and the ability to remember. Organization may be regarded as a logical part of comprehension, but in any program for the improvement of this ability it is necessary to focus upon it as a special objective. The ability to remember what has been read involves special technics which are not likely to be developed unless specifically set out and practiced. It is possible that a fifth group of abilities should be added to these four, including such technics as judging the worth of books; and the proper use of indexes, tables of contents, of

[1] A paper presented at the meeting of the National Association of Directors of Educational Research at Atlantic City, N. J., March 3, 1921.

dictionaries, encyclopedias, other reference works, the card index, and other library aids.

Of these abilities perhaps comprehension should be most strongly emphasized. In fact comprehension is necessary as a basis for progress in any of the other abilities. Rapid reading without comprehension is of no value. It is impossible to organize properly unless one understands the detail of the material which is to be organized. Accuracy of comprehension is necessary if material which is memorized is to be of any use.

Constructive Program in Comprehension

The simplest element to which the problem of comprehension can be reduced is, of course, the word. In the last thirty years there have been a great number of very helpful studies of the vocabularies of children. All this information should be gathered up. There is need, also, of further investigations which will give us a more adequate idea of the type and extent of children's vocabularies in the various grades. There is particular need for some definite knowledge of the accuracy of comprehension of the three or four thousand words which may be regarded as basic in any reading vocabulary. It seems quite possible that one of the chief contributions of the kindergarten and early primary grades will be to give the children an enriched and highly accurate vocabulary.

Our reading and language tests have added to our information as to the ability of pupils to read sentences of varying length and complexity. We need, however, much more careful studies to point out degrees of difficulty in various types of sentences and to discover the elements of sentence structure which cause most difficulty. As a part of this work it is important to have a study of technics by which pupils may be encouraged to read in terms of thought units.

The low ability of students to understand paragraphs has been shown by such studies as that of Thorndike. During the last three years there have been a number of experiments at the University of Iowa to determine the ability of students to read paragraphs taken from textbooks in such subjects as history, geography, mathematics, hygiene, and science. The following is typical of the selections and exercises used.

I want to see how carefully you can read a short paragraph. After you have read it you will be asked to answer some questions about it. In answering these questions there are three things you should remember. They are:

1. Give just the information needed to answer each question but make sure that the answer you give is to be found in the paragraph.
2. If any question is asked for which you think there is no answer given in the paragraph, write on your paper, "The paragraph does not tell."
3. You may read the paragraph as often as you wish to make sure your answers are correct.

Now that you know exactly what to do, read the following paragraph and answer the following questions just as you have been told, remembering that you may have all the time that you need.

PIONEER FURNITURE

The big fireplace would be among the first things to attract attention. Above it, resting on a shelf, or mantel, would be seen a candle, a clock and one of the housewife's most beautiful plates. Within the fireplace fastened at one side would be seen the crane upon which hang the kettles over the blazing fire.

Sketch the picture you see when reading this paragraph.

A large proportion not only of the elementary-school children but also of high-school and college students and even of superintendents drew for a pioneer clock a modern alarm clock.

After using this illustration in a lecture on the subject of silent reading a teacher in the audience decided to test the comprehension of some of her pupils. The class was reading in preparation for Washington's birthday. One pupil had just read the sentence "Washington was very fond of outdoor sports." Upon being asked the meaning of this sentence he said, "Those were the fellows he ran around with."

It is entirely possible that much of the difficulty college students have in their work grows out of their inability to read accurately. In a series of experiments now being conducted at the University of Iowa, it is shown quite clearly that there is a considerable number of students who cannot read anywhere nearly as well as some students in the elementary school. In fact students are found in the freshman class who score in comprehension only one-fifth as high as some of the elementary-school children. A great many university students were found whose reading ability was of such a nature as to constitute a very serious handicap.

The main principles underlying a constructive program in improvement of this ability are:

1. The course of study must be enriched. This is not only the best method by which a vocabulary may be made more accurate and more extended, but it is also the best means of insuring that a large amount of factual material will be read.

2. It must be recognized that comprehension can best be taught and measured where material is logical and factual in character. For the purposes of developing comprehension, literary materials are likely to be inferior to selections which deal with such subjects as history, science, and geography.

3. Some of the best teaching of comprehension can be done in connection with the proper assignment of lessons. If assignments are focalized, if they involve large amounts of reference reading, and if the study period is properly supervised the study involved constitutes a very efficient and practical method of improving the ability of pupils in the comprehension of what they read.

4. As a part of all exercises in comprehension great care must be taken to provide rigorous tests. Not only should the student have an opportunity to show how accurately he has comprehended what he has read, but he should develop definite prejudices against reading which results in "half baked" or inaccurate ideas.

Constructive Program in Speed

We shall probably find that too much attention has been given in the last three or four years to the development of speed in silent reading. No doubt this is due to the fact that speed in reading is easier to measure than are any of the other qualities. Small improvements and differences are comparatively easily shown. Moreover, considerable improvement may be made rather easily, since the prevailing rate of reading is in general rather low.

In brief, studies of the status of speed in reading seem to show that the improvement in this ability in grades IV-VIII and beyond is not what it should be. For a time the flattening out of this improvement curve led many students of the problem to assume that the ability was approaching its limit, and that additional practice exercises would give a small amount of return. However, the ease with which the standard rates for the various grades

have recently been surpassed by experimental groups seems to indicate that the rate for the intermediate and grammar grades is probably the result of poor methods of teaching.

It should be clear that one ought not to speak of *speed* in silent reading but rather of *speeds* in silent reading. The rate at which one should read is determined both by the material read and by the purpose in mind. It is quite possible for sixth-grade children to skim at rates running from six to nine hundred words a minute and to do so with perfect efficiency where the purpose is to discover the answer to a simple question. On the other hand, where material is rather difficult and is to be learned with some completeness, a reading rate of one hundred words a minute for the same children might be high.

How speed may be improved.—In all grades, and especially in the earlier years, provision must be made for *eliminating mechanical distractions* and for giving control of the mechanical phases of reading. All special exercises, such as phrase flashing, speed exercises in reading short directions, etc. should have for their purpose the shortening and strengthening of the bonds between the printed symbol and the idea for which the symbol stands. It should be remembered that it is quite probable that all tendencies to articulation are harmful except in the case of verbatim memorizing.

This raises the whole question of the teaching of phonics. It seems probable that any tendency to stop to analyze a word phonetically constitutes a distraction, although at some times a necessary one. A reference to phonics should be made by the child under much the same circumstances as those under which we refer to the dictionary. In other words, he should not be conscious of the phonic make-up of a word except when he must use this knowledge to determine what the word is. Perhaps an investigation is needed to show whether or not there is some subtle phonetic sense which aids in the rapid identification of symbols even when the reader is not conscious of the use of phonics.

It is the writer's judgment that a small amount of phonics should be taught in grades I, II, and III; and that, beginning in grade IV, a transition should be made to the pronunciation keys in the dictionary.

Basic principles.—The most essential condition for exercise in the improvement of speed is perhaps to be described under the

term "time pressure." If, however, the exercises are to be given so that proper reading habits will be developed, the child must read within the limits of perfect comprehension, and should realize that the results of his reading will be rigorously tested. These conditions hold whether or not the exercise consists of short word and phrase flashing or of the reading of longer selections.

In the case of longer selections, such as are found in the ordinary text, other conditions should exist. First, the material should be factual in character. Second, the child should have a purpose to guide him in his reading. Third, he should read at top speed but within the limits of perfect comprehension and without fluster. Fourth, he should be tested rigorously over the material read.

Where this is done there will be not only an increase in speed but also a large increase in comprehension. Dr. O'Brien's experiment, reported in the *Twentieth Yearbook of the National Society for the Study of Education, Part II*, showed that, according to one method of computation, the groups having special silent-reading drill made 31 percent more improvement than the groups having the ordinary work in reading.[2] Of course, such improvement is eminently worth trying for. But from preliminary experiments, organized on a somewhat different basis, it seems clear that as great an increase may be obtained in comprehension as in speed. For example, in one exercise children are given a problem, the answer to which they are to get by reading. They are asked to read at top speed but within the limits of perfect comprehension. They read with the knowledge that they are to be tested. At the close of the exercise a rigorous test is given in order to determine whether or not the answer which they secured was the complete and accurate answer to the question for which they read. There is reason to believe that the effect of reading under the guidance of a problem is not only to speed the child up but also to make conditions favorable for more adequate comprehension. At any rate, comprehension scores and speed scores do improve very rapidly where such drill exercises are given.

In addition to such special exercises as have just been described, there should be a large amount of reading of rather easy materials.

[2] O'Brien, John A. "The development of speed in silent reading," *Twentieth Yearbook of the National Society for the Study of Education, Part II*, p. 61, 1920.

This may be done in a free reading period and in directed home reading. For this purpose literary material may be used along with books of an informational sort. Without entering into a discussion of the reasons for this type of reading, it is significant that most students of the problem of improving speed in silent reading encourage extensive reading of easy material.

I do not believe we are yet in a position to say what sort of speed scores may be expected in the case of children in the various grades. As pointed out earlier in this paper, the scores will vary with the type of material and with the purpose for which it is read. In the case of such careful reading as students should do in preparing their geography and history lessons, the rate is probably less than children make on the Courtis test. According to Dr. Germane's[3] findings, the rates in words per minute at which the children of a certain city read an article on tuberculosis were: sixth grade, 168.1; seventh grade, 168.9; eighth grade, 185.0. In the same city, the rates for reading an article on peanuts were: sixth grade, 165.9; seventh grade, 171.5, eighth grade, 197.5. Judging from the comprehension scores, even this rate was too hurried.

However, children who had had special drill were found to read these exercises with much greater speed, and with much better comprehension.

The Constructive Program in Organization

In a way organization may be regarded as subordinate to comprehension, but no amount of practice in the comprehension of the detailed data of an article will give satisfactory power in organization. This ability is very important. A very great proportion of the reading which we do involves the necessity of getting at the main points and of organizing these, usually according to some purpose. Dr. Germane found that a summary of material read often gave smaller returns than the same amount of time spent in thoughtful re-reading. A study of the detail of his experiment revealed that this was due to the fact that an ordinary pupil could not organize the material in the selection adequately and, therefore, could not summarize. This points rather clearly to the need of frequent and rigorous exercises in

[3] Germane, Charles E. *The value of summarizing in silent reading as compared with the re-reading of the same article.* Doctor's thesis, State University of Iowa.

getting the main points out of a paragraph or chapter. Detailed exercises cannot be given here. It seems probable, however, that the best conditions under which such exercises may be developed are to be found in the regular work of the school. If assignments are focalized and detailed, if the student is encouraged to work carefully but at top speed during his study period, and if the recitation is based on the questions put in the assignment, considerable ability to organize will be developed. However, short exercises are necessary in order to put before students standards of the sort of work they are expected to do, and in order to develop proper methods of work.

Constructive Program in Remembering

The constructive program in the development of the ability to remember what is read is based upon two things: first, that a single reading ordinarily gives a very small return, and that even this small return is very rapidly forgotten unless additional work is done to fix the material; and second, that there are certain technics which are superior for learning material thoroughly and for future use.

An investigation by Yoakum[4] showed that the amount of material that could be reproduced immediately as the result of a single reading varied with types of material, but that ordinarily the proportion retained ranged from 20 to 40 percent. He found also that unless the material were read a second time, or unless some exercise was given to fix this material, very little would be retained after a few days.

As to the technic of remembering materials, Germane's investigation seems to show that until students have learned to summarize efficiently, better results are to be obtained by continued thoughtful re-reading, and by summarizing with the aid of questions prepared by the teacher. As in the case of other exercises, the best work in establishing the habit of learning material for future use can probably be done in connection with such subjects as geography, hygiene, nature study, and history. The proper conditions seem to be to read under the guidance of a problem or series of problems; to read directly through the article at fair speed but within the limits of perfect comprehension;

[4] Reported in part in the *Twentieth Yearbook of the National Society for the Study of Education, Part II*, page 70 ff.

to have a set of questions, preferably the set presented in the assignment, which may be used for self-testing and as a basis for summarizing the material.

Dangers

As a sort of summary to what has been said, it may be well to point out certain dangers which must be guarded against particularly.

First, speed exercises are likely to develop a *habit of "half-baked" and careless* reading, unless there be a strong emphasis upon comprehension and upon rigorous tests of results attained. Teachers must be urged to keep in mind always that only within the limits of accurate comprehension are speed exercises safe.

Second, there is a danger that an *interest in devices* and in more or less spectacular methods will weaken the teacher's attack on some of the more prosaic but necessary exercises. Certain devices, such as those which involve following directions and rapid flash card work are novel. Moreover, they make good show lessons. *A teacher must keep in mind that her best work will be done with exercises which approximate the sort of reading pupils are most frequently called upon to do in preparing lessons.*

Third, there is danger that teachers will use methods which, while attractive, are very uneconomical as methods of learning to read. This is particularly true of such exercises as those in which the pupil constructs something in answer to a reading lesson. The chief value in the construction is its measure as a test of complete comprehension. This is, of course, a real contribution for any exercise to make. Where such a test necessitates construction work extending over a period of 20 or 30 minutes it is clear that, for the purpose of developing ability in reading, the test is very expensive in time.

Fourth, there is a danger that an *undesirable consciousness of the process of reading* will be developed. In such a case the child goes through the motions of reading very rapidly, but the consciousness of the process operates as a distraction. It is best to avoid asking the pupil to read carefully, or to read accurately, or to read fast, but rather to give such directions as, "Will you find as quickly as you can the answer to this question, 'What are the uses to which peanuts are put'?" Such a question puts the child's attention where it belongs, namely, upon the thought, and will tend to insure the avoidance of any undesirable reading consciousness.

PRESENTING EDUCATIONAL MEASUREMENTS SO AS TO INFLUENCE THE PUBLIC FAVORABLY[1]

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I. THE SITUATION

The growth of educational measurements during the past decade, curiously enough, cannot be adequately described in simple numerical terms. We have statistics enough about the number of tests sold, the numbers of books and articles treating of measurements, and the lists of courses in measurement work offered in schools of education and summer sessions. But this growth has been so phenomenal that mere figures are too weak to express it. To do it justice, we need to employ forceful images such as likening it to the gigantic business expansions of the war period.

But the great business concerns have been forced to curtail expansion and to devote their major energies to securing public demand for relatively small outputs. In like manner numerous signs indicate to a thoughtful observer that educational measurements must soon face a similar situation. Effective work in school measurements requires amounts of money which uninformed taxpayers will surely withhold. As a new movement in school work and as an agency certain to secure and to publish the exact facts, it will be early attacked by unscrupulous politicians accustomed to raise the economy cry with reference to public expenditures. To secure adequate financial support, it will be as necessary in the near future for a measurement bureau to convince the taxpayers that it gives unusual value for their money, as it now is for an automobile manufacturer or a clothing merchant to prove that he is offering a superior product at a bargain.

For the sake of better schools it is highly desirable that the educational measurement movement go steadily forward unhampered by lack of necessary financial support. To this end the speaker offers suggestions derived from an extensive study of the claims made for measurement work, as well as of publicity efforts in various school lines and in business salesmanship. Most analyses of successful procedure in publicity and salesmanship

[1] Address delivered in part before the meeting of National Association of Directors of Educational Research, Atlantic City, N. J., March 3, 1921.

stress the use of talking points and the handling of objections. Accordingly, it seems profitable to use this classification here.

II. Talking Points on Measurement for Strong Appeals to the Public

1. *Factual basis.*—The average taxpayer, in a time like the present financial stringency, is disposed to fight all appropriation increases. His representatives know this and make a display of voting against heavier taxes. To overcome such opposition, a cause must rely upon one or more of three supports. It must show a powerful emotional appeal, it must demonstrate that it is backed by an array of votes not safely to be ignored by a politician, or it must present its needs with such sound and exhaustive exhibits of facts that no reasonable voter can refuse its requests. School measurement work at present cannot hope to arouse much emotional support, although there should in time be a chance to exploit the very excellent work now being done in giving neglected children individual attention through disclosures made as a result of measurement work. Some of the items on work for neglected individuals reported at this convention have all the emotional possibilities that even a welfare worker of the "sob" school could desire. At present measurement work has little chance to secure support through popular votes. But it deals with facts as does no other phase of school work. It has an enviable opportunity to show a hard-headed business man or taxpayer that its requests for money are founded upon a minimum of theory and a maximum of facts. It can evolve a presentation based upon facts that cannot be really opposed and that can be answered only by evasion. It is thoroughly equipped to show up such evasion for precisely what this procedure is worth.

2. *Definiteness and finality.*—The average citizen interested in education does not care for vague general criticisms of school work. He distrusts elaborately qualified evaluations. He has no patience with the type of scientific "hedging" so often heard at our measurement discussions, "these conclusions are only tentative," or "this is probably the safer hypothesis unless so-and-so should prove to be true, which cannot be fully established until further investigations are made." Such cautious statements, while indispensable at scientific meetings, only incite his ridicule. He desires a direct authoritative statement of what is really known. If a thing is uncertain, it had in his opinion better not

be mentioned. He desires this statement to be clean-cut and often prefers it expressed in approximate numerical terms. Measurement work can point out the particular grade in a school system that needs special attention. It can state that the work in this grade is weakest in a certain subject. It can specify, for instance, that the arithmetic shows better results in speed than in accuracy. It can analyze the fundamental processes involved and show just which ones need strengthening. It can show how any such record compares with a standard or with work in comparable schools. All such things can be done with greater definiteness and finality by measurement work than by any other form of supervision.

3. *Brevity.*—In regard to school needs, the average citizen is like the Yale students who were never converted by any sermon after the first twenty minutes of it. He is not apt to be converted to increased school taxes after the first twenty minutes of any given effort. Measurement work, by virtue of its power to express its summaries and comparisons in statistical terms, has a distinct advantage in the public presentation of its needs over many other phases of school work. A measurement bureau, for instance, ought to be able to prove the case on any reasonable school need for more money in a fraction of the number of pages or lines of type necessary for many other school workers who might try to prove the same case.

4. *Impersonality.*—Theoretically, measurement work makes its studies with less personal bias or pre-judgments than any other kind of educational investigation. In actual practice measurement work sometimes appears to attempt to measure phases of school activity that are not easily or profitably subjected to numerical treatment, and to stress formal matters unduly. But if measurement workers are reasonably careful and use plenty of common sense, they can justly claim a very strong talking point for their pronouncements. They can be less successfully accused of sweeping statements, of hasty conclusions, and of hobby-riding than can any other persons attempting to evaluate school work. Their standards and procedures are often so simple that they can easily set a pupil to measuring for himself his own progress in school work.

5. *Prestige of up-to-dateness.*—A final talking point grows out of the fact that measurement work is now generally regarded in leading educational circles as one of the earmarks of an up-to-

date school system. If there is no unjust depreciation of the work of those who were making careful quantitative studies before the term "measurement" came into general use, this prestige value can be played up to great advantage. Teachers and communities may be frankly somewhat skeptical on many phases of measurements. But if the suggestion has been skillfully made that those opposing measurement work are thereby in danger of being considered unprogressive, many people will hesitate to oppose it. Much of the present vogue of measurement work undoubtedly is due to skillful exploitation of this particular prestige value. This talking point of course is more useful now than it will be after some years.

III. Objections

In good business organizations, salesmen are coached not only on talking points but on all possible objections. They are not to bring up objections, but they are to be ready to utilize any that may arise. The former sales manager of the Ford Motor Company in his books on salesmanship takes great pains to elaborate the view that an objection if real is a sign of interest on the part of the customer.[2] Briefly, the analysis runs thus: A possible customer does not take the trouble to object to a thing which has not attracted his serious attention. The objection is a sign of energy or attention to the proposition. It is the salesman's business by a skillful presentation of his case to divert this energy rather toward than against the proposition.

What, then, in the mind of the public, are the chief objections to measurement work for which the director of measurements should be prepared?

1. *Measurement work is too costly for the results secured.*—From the available literature and from fairly numerous reports, it is certain that in the present flush of enthusiasm some measurement workers have forgotten that the public will judge their activities by the same economy standards which they employ in evaluating school work. Any well-developed measurement bureau attempts to determine whether money for schools is economically spent and suitably apportioned according to the importance of the various phases of school work. The taxpayer is easily interested in the results of such analysis. He is certain to object to putting more money into measurements until he sees how this measurement work appears under the same kind of

[2] Hawkins, Norval A., *The selling process*, chap. x.

analysis. The measurement bureau should accordingly be prepared to show that its own expenditures are justified. It spends some money and it consumes time and energy of both teachers and pupils. This time and energy represent the same cash value when expended upon measurements as when devoted to arithmetic or the keeping of school records. The measurement bureau must be ready to show better results for such cash equivalent than would have been secured by the regular school work that would otherwise have gone on. If approximately the same results can be secured with a twenty-minute test as with a forty-minute one, or with a battery of tests instead of with many different tests, or if a five-cent test will do instead of a ten-cent one, or if the clerical labor involved in one is only a fraction of that needed for a similar test, or if a rough oral test will suffice for an elaborate written one, the bureau should do the economical thing and advertise the fact.

Sometimes measurements produce only results that any careful, experienced observer in the system could have secured with a fraction of the money, time, and energy necessary to secure them through measurements. In such a situation the expenditures for the measurement work can best be defended by playing up impersonality values and uses for convincing incompetent but obstinate teachers of their incompetence.

It is, however, easy to make out a very strong case for the economies possible under the right kind of school measurement work. An examination of only the first ten numbers of the JOURNAL OF EDUCATIONAL RESEARCH and a few other periodicals indicates such economies as the following. To save space, only the volume and page references are given. Unless otherwise specified, the reference is to the JOURNAL OF EDUCATIONAL RESEARCH.

a. A much more accurate knowledge of individual abilities of pupils which may be utilized to let brilliant pupils out of work they do not need (2: 12, 13); to enable the teacher to know in 90 percent of cases just what each pupil needs (2: 620); to detect cases of shamming and laziness in pupils (2: 12); to reduce failures in high schools through superior guidance by teachers (1:380); to make more serviceable reports to parents as to their children's needs (*American School Board Journal*, February, 1921, p. 62; *Educational Review*, 59, p. 346).

b. The choosing of much better texts and the paying of prices necessary to secure suitable texts (1:119, 222-24; 2:671).

c. Better time allotments for subjects (2:736-40).

d. The saving possible by increasing the rate of speed in silent reading (1:136).

e. The actual cost of short terms and poor teaching in rural schools (1:271; 2:636ff).

2. *Some measurement workers do not seem to use enough common sense.*—Friends of the measurement movement, to say nothing of uninformed or hostile persons, feel that measurement workers sometimes exhibit a great deal of clerical and mechanical activity with insufficient thought and common sense. This is the idea back of Monroe's observation that teachers often consider tests as teaching devices and express dissatisfaction that pupils do no better after them.[3] It was also in the mind of the intelligent man who told Ashbaugh that bureaus of reasearch so far had been simply "accounting" bureaus.[4]

Now, in ordinary life we object that taking snap judgment is unfair. But all of us know that in some schools children are being assigned to grades or promoted largely on the basis of one brief intelligence test—"in twenty minutes branded for life" as one keen observer recently put it. A capable school man without any direct knowledge of measurements told the speaker recently of the case of his two boys in a school system with which the man had no connection. Last year in this system half-yearly promotions were started. The pupils for the higher sections were selected by taking the results of one intelligence test, given carefully under expert supervision before Christmas. On the basis of this test one of the man's sons was promoted and one held back. Later in the year another similar test was given with equal care. The advanced boy was then pronounced average and the boy who had been held back was then said to be very intelligent. The father has made every allowance of which he can think, but naturally he wonders what it was all about. A trained measurement worker knows that occasional errors of this sort are inevitable; but it is very difficult to bring the ordinary man to this point of view, much less to induce him to vote more money for such work.

Common sense is indicated by frankly recognizing that there are still many phases of school work where measurements cannot

[3] *Journal of Educational Research*, 1:97. [4] *Ibid.*, 1:421.

be profitably used. In some cases they probably never can be. Then, too, judgment needs to be exercised in the applications of results. Per capita costs, for instance, are very valuable in their place, but of little value for final pronouncements on upper classes, new departments, or elective courses, especially in small schools.

In Wisconsin we often wonder where the common sense was when the recent Ayres report on state school systems was compiled. The speaker has the greatest respect for the high purpose behind this great pioneer effort in educational research, as well as for the conspicuous ability that planned and executed the report; but the failure to use common sense in some places has materially lessened the value of the report to us in Wisconsin. From an educational campaign standpoint, nothing could be simpler than employing the social psychology involved in the fact that Wisconsin ranks thirty-third on this list and state pride wishes her to be near the top on any commendable list. But this campaign procedure is impossible because careful readers of the report, whether they are school men or not, are soon struck with the fact that certain important elements have been altogether omitted. The report, it will be recalled, attempts to measure just two things, attendance secured at public elementary and high schools, and expenditures upon these schools.

On the attendance basis Montana, the first state on the general list, is credited with a huge school enrollment which has been said by the United States Bureau of Education to be largely due to unusual immigration since the 1910 census. The Canal Zone, which gets only one-fourth of its children into school, has a higher index by several places than does Wisconsin where half the children are in public schools, to say nothing of many more in parochial schools. In the general list Wisconsin, with an illiteracy rate of 32 per thousand for those ten years of age and over, is thirty places below Arizona which has a rate of 209 per thousand for the same ages. From a common sense standpoint literacy in these ages would show about as clearly as anything the real results of public school work.

Although half the emphasis in the report is upon expenditures for public elementary and high schools, any account of money spent upon training teachers for these schools is omitted. Thus Wisconsin draws thirty-third place in the general list, notwithstanding the fact that, as nearly as we can figure, she spent in the year considered more money upon the training of teachers than

the first three (possibly four) states in the list combined, although, taken together, they had something like three times her population and about three times her wealth. From a common sense standpoint such a ranking procedure is similar to that of a physician who would attempt to pronounce upon the health of a man by examining only the lungs and the digestive and excretory organs with no attention to the heart or circulatory system.

It is only fair to state that part of the extraordinary ratings assigned to Wisconsin came about because of a misunderstanding of the data in the state reports to the United States Bureau of Education which were used for the report. Here common sense would have led one to suppose that staffs of state departments of public instruction lost the services of members assigned to war service and had changes in personnel which would make the reports on this period at best somewhat doubtful. Common sense would also have avoided adding in the total number of teachers for Milwaukee (something over 10 percent of the teaching staff of the state) while omitting in some of the calculations all the expenditures for their salaries, which are naturally the highest in the state. Certainly, common sense would have suggested that school data collected for the year 1918 with all the disruption of school systems in that year, ought to be visèd before publication by the only persons competent to eliminate such an error. If only the common sense device used by Flexner in his study of medical schools for the Carnegie Foundation had been used, much of the trouble could have been cleared up before publication. Flexner's study was practically impregnable because he was able to say that his every statement about a medical school had been submitted to the school in question and this school had been given full opportunity to disprove it or to demonstrate what modification ought to be made before publication.

It is only fair also to state that the Ayres report accomplished considerable good by focusing attention upon the plain facts that Wisconsin does not spend enough money upon her public schools and does not secure a good enough school attendance. But the failure to allow for the elements mentioned resulted in more use of the report by politicians, educational factions, and spiteful busybodies than by school men.[4a] Had the report been able to

[4a] Since this address was delivered, the defeat of Superintendent Cary of Wisconsin for re-election in a campaign in which this report was extensively used against him, furnishes an interesting example of the uses to which such a report may be put. Although

withstand the common sense test, it would have been worth several times as much to us in Wisconsin.

In a recent number of the JOURNAL OF EDUCATIONAL RESEARCH there appeared

> A list of states whom use of tests hath blest
> And lo, Wyoming's name led all the rest.[5]

As we are always on the watch in Wisconsin to analyze the secrets of success elsewhere in order that we may better our own work, we looked into this situation. According to the article the states were ranked on the basis of "systematic use of standard tests in cities of ten thousand population or over." Wyoming had a rating of 80 percent on this, counting five cities as in this class. The large number of such cities in Wyoming seemed unusual and the back of the well-known book company calendar credited the state with only one city that large in 1920. Later it was found that the ranking had been made from data given in a previous article in the same journal by another writer who had attempted no such ranking. The latter, in addition to writing to cities of 10,000 or over, sent letters in the country at large "to a few cities of less than 10,000 population where there was special reason for thinking that research work had been provided for." Every precaution may have been taken to safeguard this procedure scientifically so that all states would be fairly treated in this supplementary list. It, however, resulted in adding four cities to the original one city of Wyoming. If additional cities for Wisconsin had been chosen on the basis of the same extension of census limits alone, at least twenty additional cities would have come in for this one state. The addition of the small cities in the manner used may be explained and possibly justified to trained measurement men save

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carefully labeled "An Index Number for State School Systems," the study was popularly known throughout the state simply as "The Ayres Report." The defeat of Superintendent Cary by 29,939 votes in a total of 385,003 appears in the light of careful inquiry by the writer to be due to the determined opposition of three groups: (1) rural taxpayers disgruntled over the state superintendent's condemnation of disreputable school buildings and his agitation for living salaries for teachers; (2) powerful parochial school organizations representing two faiths; (3) manufacturers who raised a large campaign fund against him because he uncompromisingly opposed exploitation of the regular public school system by employers interested primarily in vocational training.

No one of these three groups has ever been accused of desiring to increase taxes for regular public schools or attendance at them. Yet only by increases in these two items could the state's standing in the report possibly be raised, no matter who was state superintendent or what his policy might be.

[5] *Journal of Educational Research*, 3:72.

for the distortion liable to be caused by running component percents on very small groups. But the ordinary man looking at the matter from a common sense standpoint is not apt to see this. In his mind, to balance the addition of four cities for Wyoming, cities would have to be added by the dozen for some other states.

The measurement movement is facing a serious problem in regard to the common sense likely to be exhibited by many of the new measurement workers. The leaders in the movement so far have in the main been men and women of considerable actual experience in teaching who later added their measurement equipment. They have thus been able to make valuable interpretations and applications of their measurements. Now, however, the educational institutions are sending out many youngsters highly trained in measurement technic but sometimes woefully ignorant of the school work which they are attempting to measure. The more gifted of these will, of course, soon recognize their limitations and in time will undoubtedly overcome this handicap by hard work. But where many of them will get the common sense necessary to make their interpretations and pronouncements really valuable is indeed a problem.

3. *Too little constructive help is given after tests.*—Probably no experienced measurement worker would claim for a minute that public school systems should do any measurement on their own account except for constructive supervision. Some superintendents, of course, do measurement work in their schools for their graduate theses; but most of these sincerely believe that they are materially bettering the regular school work by such studies. Every progressive school system expects to share in aiding fruitful measurement research carried on by the higher education agencies in its territory. But even here the expectation is that the results will be sufficiently valuable to the local system to justify the time given to the work. Most of the measurement literature in the JOURNAL OF EDUCATIONAL RESEARCH stresses the view that measurement is merely for results whose interpretations and applications are of material aid to the schools tested.

But notwithstanding all these good intentions, in altogether too many cases the measurement work stops short of giving the expected help to the schools tested, and certainly it stops short of making adequate recompense for the expenditures on the work. In Wisconsin, for instance, in some counties supervising teachers are devoting much of their time to visiting teachers who are giving

tests. Then they stay in the office to work up the results which they send to the inexperienced girls in the rural teaching positions. Much of this work is extremely valuable. But the public in many places is not yet convinced that it can produce better results than the same time expended in demonstration teaching by the supervisor, in observing the teacher's work, and in giving the latter helpful personal suggestions and criticisms. From all over the country come reports of so much testing by some teachers that insufficient time is left for the actual teaching. An intelligent and progressive city superintendent in all sincerity recently remarked that he could not see why so much testing was done for silent reading work when measurement workers say there is a very high correlation between silent reading ability and intelligence. That is, he had not seen that the testing had resulted in more than saying that the naturally intelligent children would do the best silent reading anyway. At our Wisconsin City Superintendents' Convention last October, a very capable superintendent, one who tries to keep up with every school improvement, said publicly that the testing for silent reading and the emphasis upon securing better results in it seemed likely to end in dropping literature and the oral reading necessary for the appreciation of poetry and the finest prose almost wholly out of the course of study. In his thinking the loss of an appreciation of literature could not be offset by any gain in silent reading for mere information. At a conference some time ago a leading educator expressed doubt as to the value of so much testing for promotion purposes when a very high correlation has been shown between the results of good intelligence tests and the opinions of competent teachers as to which children should be promoted. No doubt the skilled measurement workers have excellent reasons for their procedure and can, fairly easily, answer such objections. But the point here is that such objections from thoughtful people ought to be guarded against in advance as much as possible.

These and similar observations of competent practical school men indicate the great work yet to be done in emphasizing that the interpretation and application of results are of chief importance. Part of the difficulty doubtless arises from the comfortable definiteness of the mechanical processes involved in the measurement work. Most teachers are like most people; they do not care for the strain involved in what we call creative or purely original work. Interpretations, applications, and definite outlining of

remedial measures form the hardest kind of work, a kind actually painful to many people. But the tests are worked out with such explicit directions by the makers that the giving of tests, scoring, and compilation of results are routine work necessitating little real mental effort. The teachers are perfectly willing to devote any amount of time to this and really think they are achieving something. Whether this is really the case or not, all measurement workers need to measure their own efforts to see what actual help comes to the schools from it. And they will need to convince the public that this help is an adequate return for the expenditures involved. This should be a fairly simple matter for it seems only reasonable to suppose that a measurement worker should be able to evaluate and improve his own work more easily than can any other kind of school man.

4. *The style of presentations of measurements for the public should be radically different from that for fellow measurement workers.*—Probably no one would contend for a moment that the style ought to be the same for the two groups. Certainly the National Association of Directors of Educational Research would not. They have already made a distinction between their association meetings and their open meetings. They also know that the public as a whole has only about the reading ability of a fifth-grade child. But the fact remains that there are still too many measurement bulletins and measurement sections of surveys which appear to have been written with one eye on fellow workers and the other eye on the public. Such publications, unless very skillfully presented, can influence the average taxpayer only as he has respect for something which he thinks is beyond him. Such an attitude on his part is not apt to make him advocate more money for the work.

In this connection we may take advantage of the experience of the United States Department of Agriculture and of the various university extension organizations. These long ago found that the style of matter intended for the public must be radically different from that for fellow scientists. These organizations issue bulletins for scientists and then interpret and explain the same things in public bulletins of a very different nature. In educational work there are a few examples like the publications of Dr. Ayres for the Russell Sage Foundation which are effective with both groups. But in the main, the practice of separate publications is much better.

Form elements in material for the public merit special emphasis. Presentations for the public should translate statistical results by taking advantage of ideas already understood by the average man and by utilizing purely local illustrations. Many people have the essentials of statistical ideas ready for measurement workers to utilize. Thus the speaker a year or two ago ran across an old deer hunter who was talking of the refusal of some city hunters to wear red caps or coats. They said it was dangerous because far more men were shot who wore red than who did not. The old hunter had the correct statistical idea when he remarked that because practically all deer hunters wore red, more wearers of red would be sure to be shot anyway. Again, in Birmingham, Alabama, years ago someone laid down the regulation that the passing mark in any class was to be 10 percent below the class average calculated from grades on a scale of one hundred. The author of this rule, and all teachers following it, had certain very important statistical ideas all ready for measurement work to start with.

Spending energy on translating measurement results into forceful images familiar to the local public is profitable work. Thus in Wisconsin, in securing support for county training schools last year, we showed that the typical tax burden for county support was the price of one egg per thousand dollars of assessed valuation for each year. This year, in order to have finer divisions, we have employed the price of milk to the farmers at the condenseries. Thus we have been able to show that in one very wealthy county, the county training school has cost the equivalent of one-half pint of milk per thousand dollars of assessed valuation for the year. This fall a Wisconsin county superintendent, in a county where many miles of cement road are being built, discomfited the advocates of low school taxes by pointing out that the cost of rural schools in his county for the year was just equal to that of two miles of cement road.

Time is not available for an extended treatment of other useful matters of form, which have been treated at length elsewhere by the speaker.[6] But certain items merit listing. For public presentation, each statistical table should preferably express but one idea. The printing should be easily read from one position. The print should be large enough to avoid eye fatigue, especially on the part of older and influential taxpayers. The data in tables should be

[6] Alexander, Carter. *School statistics and publicity.*

shifted from an alphabetical or other purely arbitrary arrangement so as to bring out their sequences. Forceful graphs and pictures may be used to illustrate definite points and should be so labeled as to be easily intelligible by themselves. Material so labeled is of special value for lantern slides to be used in presenting measurements at various public meetings. The tables in the educational reports of the Russell Sage Foundation are excellent models for this. It is well to note that advertisements, which often contain statistical matter, use graphs very sparingly. In much measurement publicity the best results will probably be secured by a series of brief presentations issued at intervals, each fairly complete in itself but forming an essential part of a well-planned whole. If the whole presentation must be printed at one time, the conclusions and recommendations should be printed at the first with the extended proof in later sections. An admirable example of this is the recent study by Dr. G. H. Reavis.[7] The first twenty-five pages are very interesting and stimulating to the average man. The statistical foundations for these statements, elaborated to suit the most exacting statistician, appear in subsequent sections.

IV. An Underdeveloped Field

According to an editorial by Terman, "History shows that when poverty-stricken schools face insistent demands for higher efficiency the result is likely to be a development along the lines of inner organization, method and procedure."[8] Our public schools with their rapidly increasing demands for money are in many places poverty-stricken, or they soon will be. On all sides we feel insistent demands for higher efficiency in school work. Measurement work will play the leading rôle in the inner development sure to take place. But such development at best can accomplish little compared to what may be done if reasonable increases in school support can also be secured. Measurement workers are prepared as are no other school men to present educational needs to the public so that better school support may be obtained. But the measurement energy so far has mainly attacked problems of inner development. The members of this association of course desire to be true educational patriots. To attain this wish, they must do their fair share of the fighting necessary to secure better school support.

[7] *Factors controlling attendance in rural schools.* (Teachers College, Columbia University, Contributions to Education, No. 108.)

[8] *Journal of Educational Research*, 1:138.

SCALE OF ATTAINMENT NO. 2.—AN EXAMINATION FOR MEASUREMENT IN HISTORY, ARITHMETIC, AND ENGLISH IN THE EIGHTH GRADE[1]

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I. Experimental Definition of the Problem

The examination described in the present paper is the result of an effort to formulate a scale for investigating achievement in the fundamental subjects in the last year of grammar school. In particular the writer has been interested in the possibility of comparing, by means of such a scale, graduation standards in different schools and school systems. There is, surely, need for such use of tests in defining certain important school requirements and standards. In reality, educational tests have been used to a surprisingly small extent in connection with actual practice in grade classification and disposition. In a sentence, the effort has been to devise an examination for measuring achievement in the fundamental subjects, primarily for the purpose of defining final grammar-school standards in these subjects. The scale is therefore intended for use in investigating the finished product of the elementary school training.[2]

In the construction of such an examination the first consideration was, of course, as to what might be the fundamental subjects which should be covered. A test in American history and civics appeared unquestionably necessary. A test in mathematical reasoning, or problem-solving, also seemed essential. A test in geography was not included, as geography frequently does not appear in the eighth-grade curriculum. The real problem arose in attempting to measure ability in English—in reading, literature, composition. In fact, the situation, as regards measurement in

[1] Studies from the Psychological Laboratory of Indiana University.

[2] As Scale of Attainment No. 1 and the accompanying first-grade reading vocabulary scale were intended to investigate the first steps in that training (see Pressey, L. W., "Scale of attainment no. 1—an examination of achievement in the second grade," *Journal of Educational Research*, 2:572-81, September, 1920; and Pressey, L. W. and Skeel, H. V. "A group test for measuring reading vocabulary in the first grade," *Elementary School Journal* 21:304–9, December, 1920).

this field, was felt to be so ill-defined that two considerable pieces of preliminary research were undertaken, before the final form of the examination was decided upon.

The first question was as to whether a test of ability in silent reading should be included in this "battery." From one point of view such a test was irrelevant to the problem. The aim was to measure achievement in the "promotion" subjects; and silent reading did not so function as a recognized entity in the curriculum—as an explicit factor conditioning a child's "passing" or "failing." But if ability in assimilative reading were so pervasively all-important as is sometimes asserted, then recognition of that fact in a proportional emphasis upon measurement of silent reading ability, in the writer's estimation, would appear desirable. A critical investigation of the situation was decided upon.

The results of this investigation have already been reported,[3] and require only brief summary here. The findings suggested that after freedom from oral reading habits had once been attained, ability in assimilative reading was largely specific to the particular subject matter and vocabulary dealt with. The findings should certainly be considered tentative until verified by other investigators; and it is hoped that other workers may be interested to study the same question with other materials, in order to determine the general validity of these conclusions. But meantime, the conclusions are by no means unreasonable. They are quite in

[3] Pressey, L. W. and S. L. "A critical study of the concept of silent reading ability," *Journal of Educational Psychology* 12: 25-31, January, 1921. The conclusion is simply that one reads understandingly in proportion as one is familiar with the vocabulary used, and with the general topic discussed, and is interested—which is surely plausible enough. And the factors conditioning the efficiency of silent reading with *any* type of matter would appear to be general intelligence and general habits of attention and methods of study. But these factors are not factors operating in assimilative reading merely, nor to be dealt with merely in that context. And (the contribution of this paper) these general factors appear to be proportionately less important than has usually been supposed, as compared with the specific elements of vocabulary, background information, and interest. Further, it is these specific elements which would seem most readily dealt with by the school. Perhaps the writer's point of view does not seem to be, in the last analysis, so different from the usual understanding of the situation. But in the emphasis, and particularly in the pedagogical implications, there is a decided difference. Especially is the importance of developing an adequate reading vocabulary stressed, in this reconstruing of the problem. And a different approach, in efforts at measurement of the factors involved in assimilative reading, is suggested.

keeping with what is known about the specific nature of most functions. And, taken in connection with the fact already mentioned that "silent reading" has not yet won explicit recognition in the usual curriculum, the findings seemed adequate to warrant the exclusion of a test of "silent reading ability" from the examination. Instead, a vocabulary test was included, on the hypothesis that vocabulary was an important element in assimilative reading, that size of vocabulary might anyhow be highly correlated with ability in "silent reading," and that increase in size of reading vocabulary might be considered one important result (perhaps *the* important result) of the work in "literature."

The second problem had to do with measurement of ability in English composition. It would obviously have been possible to obtain, as part of the examination, a brief composition, as a sample of each child's ability in written work. In fact, the first pla was that the last page of the examination folder should be left blank, and that on this last page should be written a composition which should be rated by the Willing scale.[4] But since the examination was intended primarily for extensive survey work and for use by teachers, a method which was so laborious and so subject to the personal equation of the scorer, seemed hardly practicable. Moreover, the writer felt that certain factors, tending to make results so obtained highly unreliable, had not been adequately investigated. It is known that judges may differ strikingly, in the ratings they assign to a given composition, when using any one of the standard scales for measuring merit in English composition.[5] But very little is known as to the extent to which different compositions written by the same child may vary in merit, according as that child might be interested in one topic and not in another, might be alert on one day but weary on another, might occasionally be distracted by chance circumstances which did not trouble at other times.

[4] Willing, M. H. "The measurement of written composition in grades IV to VII," *English Journal* 7:193-202, March, 1918; or see Monroe, W. S. *Measuring the results of teaching*, pp. 235-43.

[5] See for instance Kelly, F. J., *Teachers' marks* (Teachers College Contributions to Education, No. 66, 1914), pp. 108-32; Hudelson, Earl, *Second conference on educational measurements*, Indiana University, 1915, pp. 115-22; Gordon, Kate, "A class experiment with the Hillegas scale," *Journal of Educational Psychology* 9:511-14, November, 1918.

The results of an investigation of this problem will shortly be published.[6] It need only be said here that compositions written by a given child on different themes, at different times, and in different forms of discourse, may vary greatly in merit. And when all these factors, making for unreliability, are taken into account, it appears that ratings by the usual method, on a single composition from each child, cannot but be highly unreliable as measures of the ability of the individual child, and distinctly inadequate as a basis for class or school comparisons.[7] Various tests of ability in written English were, therefore, tried. And after considerable experimentation a test of "good usage" in written English, and a vocabulary test, were decided upon. These tests in combination appeared to give an excellent indication as to ability in written English. The correlation of the combined scores with estimated ability in written English was 0.72 for a large eighth-grade class. They appeared also to have considerable value for diagnostic purposes; the good usage test covered elements of "form value," while the vocabulary test investigated the equipment in verbal material, which a child had available for purposes of expression. At least these hypotheses seemed plausible, and the tests sufficiently valuable to be worth trial in such an examination as the writer contemplated.

To summarize then: the preliminary experimentation suggested that a test in American history, a test in arithmetical reasoning, a test in reading vocabulary, and a test in "good usage" in written English, should make an examination giving a very good appraisal of attainment in the fundamental subjects, in the last year of grammar school. The tests may now be briefly described.

[6] Pressey, S. L. "A critical study of the problem of measurement in English composition," to appear in an early number of the *Journal of Educational Psychology*. The correlation between merit in a narrative composition and merit in a descriptive composition (as rated by the same experienced judge) was 0.32; a total of 102 cases, all the eighth-grade children in a large departmental school, were dealt with.

[7] For instance, very careful estimates were obtained from the teachers in English, history, and geography, for the children in the eighth-grade class already referred to. The correlations between the average of these estimates, for each child, and ratings on the narrative composition made by an experienced judge, was only 0.29! It may be argued that this low rating was due in large part to the unreliability of the teachers estimates. However, the writer was able (as will appear shortly) to obtain, with two "diagnostic" tests in English, a correlation of 0.72, with these same estimates, for these same children!

II. The Tests and Certain Matters of Test Form

The directions, and first five lines, of the vocabulary test run as follows:

TEST I. READING VOCABULARY

Directions.—Below are some statements such as:

To be weary is to be: tired lazy dull quick

Here the word which correctly defines "weary" is "tired," so "tired" has been underlined. The statement now reads, "To be weary is to be tired," which is true. In each of the statements below you have four choices for the correct word, in just this way. One, AND ONLY ONE, is right. This correct word you are to underline, just as "tired" is underlined in the example. If you cannot be sure, guess. Work as rapidly as you can.

1. A dungeon is a room in a: cathedral prison store museum
2. A gable is a part of a: house book feud cataract
3. A token is a: remembrance thought epigram anecdote
4. An abbot is an officer of the: army navy state church
5. A gnarled tree is: smooth young rough leafy

The entire test consists of forty such lines. The words were selected from the glossaries of three eighth-grade readers; the forty lines finally used were selected from a large number of such lines tried in the preliminary experimentation. The items finally used were arranged in order of difficulty and scaled on a probable error scale.[8]

[8] No attempt was made at a systematic selection of every tenth word, or otherwise so that interpretation in terms of total vocabulary might be possible. The value as well as the legitimacy of such a procedure is surely doubtful. In the present instance the first effort was simply to pick words which seemed of about the desired degree of hardness and of some importance with regard to one's literary vocabulary, and which easily combined into synonyms and confusion words, for the purpose of the test.

It should be said that each one of the tests used was made up from a large number of items which had been tried with a large eighth-grade class (composed of some one hundred and fifty pupils). The form was made up from this first trial, was then tried with a second eighth-grade class of about the same size. And the final form is a revision of this last trial. The writer wishes in this connection to express his indebtedness to Superintendent E. E. Ramsey and to Miss Mary Kerr, Principal of the Bloomington Departmental School, for their cooperation in the preliminary trial and to Superintendent E. W. Montgomery and Miss Dorothy Moran, Principal of the Bedford Departmental School for their cooperation in the further experimentation with the tests.

The first five lines of the second test—Good Usage—were as follows:

1. The boys have ran away. I've fell lots of times. I rang the bell. We was on time.
2. He developed great speed. He is a foriegner. He gave me a receipt. This is a cereal story.
3. The snow and ice has melted. I've got to go. I done all of them. Should I do this?
4. He said, "Come here!" He said to "come quickly". He said; Look there! They shouted "Catch him?"
5. She don't see me. She was lying down. Donald's got my knife. What does those words mean?

The directions require the children simply to find in each line the one sentence which is in all respects correct, and to underline this sentence. The test consists of forty such lines. The odd-numbered lines deal with errors in grammar; the even-numbered lines with mistakes alternately in spelling and in punctuation. The grammatical errors were made up from various grammar tests, chiefly from Charters' Diagnostic Tests; but Starch's test was also used as well as the test material given in Sherwin Cody's "Commercial Tests and How to Use Them" (World Book Company, Yonkers, New York). The misspelled words are from "Jones' Spelling Demons." The punctuation comes largely from Starch and Cody with a liberal sprinkling of original items.

The third test was the history test. The first five lines follow:

1. The people who settled in Plymouth were: Dutch English French German
2. The Quakers settled in: Quebec Maryland Vermont Pennsylvania
3. The Spaniards explored America chiefly to obtain: furs gold trade land
4. A colony made up of debtors was founded in: Massachusetts Georgia New Hampshire Maryland
5. The Indians who lived in the western part of New York were called Iroquois Narragansetts Chippewas Sioux

The children are told simply to underline the correct response in each line. The tenth, fifteenth, twentieth, twenty-fifth, thirtieth, and thirty-fifth questions have to do with the Constitution and organization of the government. The lines were made up from Hahn's admirable scaled series of questions in American history,[9]

[9] Hahn History Scale for grades 7 and 8. Address H. H. Hahn, Wayne State Normal School, Wayne, Nebraska.

but with the use also of Van Wagenen's scales,[10] the Bell and McCollum Scale[11] and with reference also to a number of standard school histories. The proportioning, through the different periods, is according to the number of pages devoted to each period, on the average, in three such histories. It should be added that no effort was made to include "thought" questions; it was assumed that questions dealing with historical information would indicate with a considerable degree of satisfactoriness ability in historical thinking as well.[12]

The first five lines of the fourth test—arithmetical reasoning—are given below:

1. A dealer pays $18.00 for 9 chairs. The amount paid for each chair was: $3.00 $4.00 $2.50 $2.00
2. James counted 55 animals in a field; 25 were cows. The rest were sheep. The number of sheep was: 30 20 25 75
3. If an arithmetic and history together cost $1.25 and the history costs 75c, the arithmetic must have cost: 25c 50c $1.00 85c
4. If you are in school 5 hours each day, 5 days in the week, the number of hours you spend in school per week is: 20 10 25 15
5. A paint box costs 65c. If I give the dealer a half dollar and a quarter, my change will be: 10c 13c 25c 5c

The test consists of forty such items. The directions are simply to underline, in each problem, the correct answer. The test covers more or less systematically fractions, percentage, interest, mensuration, ratio, and proportion. Again, the number of items devoted to each one of these topics is roughly in proportion to the amount of space devoted to them in certain standard arithmetics. Incidentally, it should be noticed that with this form of presenting arithmetical problems ability in problem-solving is very largely kept separate from mere skill in the fundamental operations. The form of the test would seem of some interest as an effort toward such analysis.

[10] Van Wagenen American History Scales. Bureau of Publications, Teachers' College, Columbia University, New York.

[11] Bell, J. C. and McCollum, D. F. "A study of the attainments of pupils in United States history," *Journal of Educational Psychology*, 8:257-74, May, 1917.

[12] Buckingham, B. R., "Correlation between ability to think and ability to remember, with special reference to United States history," *School and Society*, 5:443-49, April 14, 1917; "A proposed index of efficiency in teaching United States history," *Journal of Educational Research*, 1:161-71, March, 1920.

The children are allowed seven minutes each on the first and third tests and twelve minutes for the second and fourth. The arrangement of the tests on the blank embodies a new feature of some interest. The second test is on the last page of the four-page folder; the third test is on the second page; and the last test is on the third page. The blanks are passed out upside down, so that the children cannot read the printing on the first page. After the blanks have all been given out the direction is "Turn your blanks around! Fill in your name, age and grade at the top of the page. Now read the directions for the first test, and do what they tell you to do." Then at the end of seven minutes the examiner says, "Stop! Simply turn your paper over, so. (Illustrate) to the back page. . . . ; do *not* open the folder. The test is named Good Usage. Read the directions for this test and do what they tell you to do." At the end of twelve minutes the examiner again says, "Stop! Open the blank at the middle (illustrate) and fold it back so that the history and arithmetic tests are outside. Lay the blanks down on the desk so that the history test is up. Now read the directions for this test and do what they tell you to do." Such handling of the blank, the writer has found, gives quite as good control of timing—prevents looking from one test to another—as printing alternate pages upside down, putting directions for the next test on the following page with directions and material separated, or other elaborate and artificial methods.

The blank thus consists simply of a four-page folder, each page the size of an ordinary typewriter sheet. The blank being thus simple, the materials are comparatively inexpensive.[13] The tests are essentially "self-giving." The examination can, therefore, be given by the average teacher without the slightest preparation except that involved in glancing over the folder, and the accompanying brief statement as to timing and as to handling the folder. The examination is very easy for the children to take, especially because of the very high degree of unification. For example, the directions are essentially the same for each test and the response is the same, namely, the underlining of the correct element. Finally, the scoring is exceedingly easy. The blanks are inside out when they are passed in by the children; that is, the

[13] The blanks with all materials are now being sold by the Department of Psychology, Indiana University, at $1.50 per hundred.

second and third pages, on which are the third and fourth tests, are exposed to view. The third test should be scored first, followed by the fourth. The blanks for each class or room should then be put inside each other, the whole set turned right side out and the first and second tests scored. The total score on the examination is simply the sum of the scores on the four tests. After a little preliminary practice it is possible to score the entire examination and to obtain this total score at an average rate of less than three minutes per blank.[14]

The examination is, then (1) inexpensive, (2) easy to give, (3) easy to take, (4) easy to score. These four practical requirements for ready usableness are, the writer feels, distinctly to be considered—and not sufficiently considered in much recent test building.

Tentative norms for the total examination are presented below:[15]

Grade	No. cases	25-percentile	Median	75-percentile
VIII	482	65.6	77.0	89.0
VIII-B	134	55.1	65.3	78.0
VIII-A	126	68.0	78.5	89.0

[14] A word remains to be said with regard to the use simply of total crude score, in summarizing results on the total examination. It is a rough-and-ready procedure, of course; and it over-weights English about 60 percent. But English is important enough to deserve to be over-weighted. And so far as the rough-and-readiness is concerned the writer feels very decidedly that any elaborate statistical treatment in combining such scores is usually not worth the time and trouble it takes. Examinations in which crude scores are rehandled as many as six times are now in use. But such complicatedness increases at least sixfold the likelihood of error. There is surely a question as to whether the original accuracy of the tests is sufficient to warrant such nicety of treatment. The writer once knew a student who carried out an elaborate experiment in which he obtained measurements on a chronoscope to thousandths of a second. And the final calibration showed that his chronoscope was only accurate to tenths. Even the best of present-day tests are distinctly unreliable. Under the circumstances, elaborate exactness in the treatment of results is simply statistical pedantry.

[15] The examinations were given in January, just before mid-term promotions.

The writer wishes to express his obligation to Superintendents N. F. Hutchison of Huntingburg, Indiana; F. G. Neel of Winamac; Owen Neighbours of Wabash; W. F. Vogel of Boonville; A. D. Montgomery of Edinburg; and to Mr. E. E. Keener, Director of Measurements in the Richmond (Indiana) Schools, for their kind cooperation in obtaining these data. The norms for the A and B grades separately are from Richmond only. The data for the eighth grade as a whole are somewhat heterogeneous, including two systems with yearly promotions only, and one system with A, B, and C divisions.

For each test, the medians in order run as below:

Grade	Test			
	Vocabulary	"Good Usage"	History	Arithmetic
VIII	20.0	14.8	20.6	22.2
VIII-B	15.8	13.0	16.7	20.4
VIII-A	21.2	15.6	20.1	22.2

The above norms for the separate tests, rather than the total scores, are, of course, the important figures.

III. The Uses of the Examination

The writer now wishes, very briefly indeed, to indicate the possible ways in which such an examination can be used.

1. In the first place, it may be used to compare schools within a given system. The writer has before him results from a certain school system, having five ward schools. In "Total Attainment" one school shows only 30 percent of its children above the median for that city. Another school has 63 percent above that median. Surely the eighth grades in these two schools are not strictly comparable; nevertheless these two schools are in this same system, the two classes are both eighth grades, and both groups are about ready to finish grammar school and to be certified as ready for high school. It is further interesting to know that the poorest school is particularly deficient in history and is comparatively best in arithmetic.

2. Such an examination may be used, in the second place, to compare different systems. Of two small systems of comparatively the same size, the first system shows 74 percent of its eighth graders above the median for the second system (the seventh-grade median of the first system is almost identical with the eighth-grade median of the other). And it is particularly interesting in this connection that the poorer system excels the other in arithmetic. Apparently "figuring" has been emphasized in the first school at the expense of the less formal work.

3. However, a third and much more important matter, from a practical point of view, does not have to do with the averages or central tendencies of the different groups at all. The more im-

portant questions are as to what the graduation requirements of these different schools may be, as to what they demand of a child if he is to be certified by them as having completed the work of the common schools, and as to how poor a child must be before he is failed in a given subject. These matters are, the writer feels, important enough to receive consideration in a separate study. They involve an effort definitely to relate results in tests with important school practices; and, incidentally, they involve some curious and interesting statistical problems. Data dealing with this matter, for the eighth-grade classes included in the present study, will be presented later.

Summary

1. The paper presents an examination for measuring achievement in the "promotion" subjects, in the last year of the elementary school, and for comparing graduation standards.

2. Preliminary investigation led to the omission of any measure of "silent reading" from the examination, and to the attempt to investigate ability in English composition by means of tests in vocabulary and in "good usage" in written English. Besides these two tests, tests in American history and arithmetic reasoning were included.

3. Tentative norms for the examinations as a whole and for each test are presented.

4. Some data are presented indicative of the usefulness of such a scale (a) in comparing different schools within the same system; (b) in comparing different systems; and (c) in comparing graduation standards from school to school and system to system.

THE RELIABILITY OF TEST SCORES

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Many methods have been used in measuring the reliability of tests. By reliability is to be understood the extent to which the test measures that which it in reality does measure—not necessarily that which it is claimed to measure. Each method has been followed because of some feature of simplicity of use, of interpretation, of result, of real or fancied accuracy, etc. From the variety of methods used, it is plain that all too frequently the desire to secure a measure of reliability which would be comparable to measures obtained by other workers with similar tests has been absent. The methods indicated by the following propositions have all served more or less successfully.

Other things being equal, of two tests designed to measure some trait, that one is the more reliable:

I. That gives a distribution of scores in greater agreement with the known or probable distribution of the trait;

II. That gives the least overlapping between two groups of individuals known to be far apart in the trait;

III. That correlates the more highly with other independent measures of the trait (this, of course, is more than a mere measure of reliability);

IV. Whose exercises are more equally spaced upon a scale of difficulty;

V. That is the longer (in the sense of containing more examples of the same type);

VIa. That correlates the higher with a second form of the test as similar to the first as possible without containing identical elements (self-correlation);

VIb. That results in individual scores whose probable errors, when expressed in terms of a measure of deviation of the group examined, are the smaller;

VIc. That results in individual scores whose probable errors, when expressed in terms of the deviation of some standardized group, are the smaller;

VId. That results in individual scores whose probable errors, when expressed in terms of the difference between two standardized groups, are the smaller.

Methods VIa, VIb, VIc, and VId are all dependent in the sense that if one is known and the definition of the group upon which it is based is also known, then each of the others can be obtained. This, however, may be a very tedious task, and these procedures are not of equal simplicity of interpretation, so that they do not have equal merit as measures of reliability. Without attempting an adequate discussion of each of these nine methods, the following brief observations are made.

I. This is an entirely inadequate method and probably would never be used were not the requisite distributions available.

II. This is a good method if two tests endeavoring to measure the same thing are to be compared, and if the two groups used in determining the reliability of the first test are identical with (or known to be closely similar in talent to) the two groups used in the second instance. This method is really but another way of accomplishing the end described in VId, but it does not permit of the accuracy and objectivity of interpretation and statement that is possible in the case of the VId method.

III. If a measure correlates very highly with known measures of capacity, it must of necessity have a fair degree of reliability, but as the converse is not true—that if a test has high reliability, it will correlate well with a valid criterion—correlation with a good criterion should be used as a measure of validity and not of reliability. The need of knowing the reliability of a test has been questioned, since the practical problem is not primarily to secure tests of high reliability. It is of no import to measure accurately some trivial capacity, but it is of great moment to secure tests, the scores in which are highly reliable indexes of ability in some known and important capacity. Expressed in statistical terms, if r_{1c} is the correlation between a test and a sound criterion, and r_{12} the correlation between one form of the test and a second form (the usual reliability coefficient), what matters the value of r_{12} if r_{1c} is satisfactory? For purposes of accuracy of estimating criterion scores, knowing test scores, it matters not at all whether r_{12} is known or not; but for purposes of understanding the similarity between the functions measured in the test and those

involved in the criterion, r_{12} must be known. The highest possible correlation which can be obtained (except as chance might occasionally lead to higher spurious correlations) between a test and a second measure is with that which truly represents what the test actually measures—that is, the correlation between the test and true scores of individuals in just such tests. These true scores may be defined as the average scores of individuals upon a very large number (an infinite number) of just such tests. This correlation between a single test and the true score in the trait measured by a single test is equal to $\sqrt{r_{12}}$.[1] This is, then, the maximum correlation which can ever be obtained (except as a matter of chance) with the test. If this is low, it frequently answers all the questions involved. If $r_{12}=0.25$ so that $\sqrt{r_{12}}=0.5$, it would be ridiculous to continue to use the test without lengthening, or otherwise improving it, in a problem which requires for valid results a much higher correlation with a criterion.

Again, suppose it has been determined from a very large population, thus obviating the factor of chance, that $\sqrt{r_{12}}=0.50$ and that $r_{1c}=0.50$. This exceptional case, only possible when the criterion is perfectly reliable, would mean that the test score, in so far as it was not due to chance, exactly paralleled the criterion in its significance. In such case it would only be necessary to increase the length of the test to secure more and more nearly perfect measures of the criterion.

Suppose the $\sqrt{r_{12}}=0.50$ and $r_{1c}=0.40$. The interpretation of this situation depends upon the reliability coefficient of the criterion. Let us first suppose that it is perfectly reliable. Then the fact that r_{1c} is less than 0.50 is conclusive proof that some of the traits which are truly measured by the test are not identical with elements of capacity involved in the criterion. These elements (of habit, memory, or what not) should be searched out and eliminated or the test will continue to measure something in addition to the criterion. This "thing in addition" could conceivably involve the same elemental traits as the criterion, but not in the same proportion.

Generally, however, the criterion is not one of perfect reliability, so that the interpretation is not so simple. If r_{cC} is the relia-

[1] Kelley, Truman L. "A simplified method of using scaled data for purposes of testing," *School and Society*, 4: 34, 71, July 1, 8, 1916.

bility coefficient of the criterion, then $\sqrt{r_{cC}}$ is the maximum possible correlation with it (except as a matter of chance). In this case the maximum value which r_{1c} can have (this maximum reached when no elements except chance other than those involved in the criterion are involved in the test score) is $\sqrt{r_{12}} \times \sqrt{r_{cC}}$. To illustrate, suppose r_{cC} is equal to 0.64, then $\sqrt{r_{12}} \times \sqrt{r_{cC}} = 0.40$. Now, if r_{1c} also equals 0.40, then the best results possible of anticipation are obtained; that is, all the factors of which the test score is a measure are (1) either factors likewise measured by the criterion, or (2) chance factors. Now, suppose r_{1c} is less than 0.40, say equal to 0.30. With reliability coefficients as given, namely $r_{12} = 0.25$ and $r_{cC} = 0.64$, it must be that at least to a degree the test score is not in its significant portion merely a measure of what the criterion measures.

It is therefore apparent that in order to answer the really important questions in regard to the test and what it measures, it is necessary to know not only the correlation with the criterion, but also the reliability of the test and, what is unfortunately seldom known, the reliability of the criterion.

IV. This is a very indirect measure of reliability. The principle, however, is important in the matter of the derivation of a test.

V. This principle has long been known and widely used. Suppose there are n similar tests and the average score upon all of these tests is taken as the score for a single individual, then, if r_{12} (the correlation between one of these tests and a second) is known, it is possible to estimate the reliability coefficient of the score which is the average of n tests. Let us designate this correlation between the average scores upon n tests and n other similar ones by r_{nN}. Since the particular n tests averaged to obtain the first score are different tests, though similar to the same number averaged to obtain the second score, the correlation is designated r_{nN} instead of r_{nn}, which latter would imply that the same tests were given twice. The symbol r_{nn} may well stand for the correlation between retestings with the same material, whereas r_{nN} is the correlation between scores based upon similar material. Brown's formula gives r_{nN} in terms of r_{12}.

$$r_{nN} = \frac{n(r_{12})}{1+(n-1)r_{12}}$$

n may be integral, fractional, greater than 1, or less than 1. The excess of r_{nN} over r_{12} measures the increase in reliability in passing from a single test to another similarly constructed but n times as long.

VIa. As mentioned in III, the greater the self-correlation of a test the more reliable it is. The reliability coefficient is, however, not an entirely satisfactory measure of reliability, for it s affected by the distribution, in the trait measured, of the particular group studied. To secure a reliability coefficient of 0.40 from a group composed of children in a single grade is probably indicative of greater, not less, reliability than to secure a reliability coefficient of 0.90 from a group composed of children from the second to twelfth grades. If it is reasonable to assume that in terms of true ability the spread of talent is four times as great in the eleven grades as in a single grade, the correlation in the second case would need to be 0.914 in order to indicate as close a relationship as that shown by a reliability coefficient of 0.40 in the single grade. The following formula[2] gives the relationship:

$$\frac{\sigma_1}{\sigma_T} = \frac{\sqrt{r(1-R)}}{\sqrt{R(1-r)}}$$

σ_1 and σ_T are the standard deviations of the two groups in terms of true ability, and r and R are the reliability coefficients of the two groups. Solving this equation for the case in which $\sigma_T = 4\sigma_1$ and $r = 0.40$, gives $R = 0.914$.

If the standard deviations of scores in two groups are known, it is not necessary to make any assumption; for then the following formula applies:

$$\frac{\sigma}{\Sigma} = \frac{\sqrt{1-R}}{\sqrt{1-r}}.$$

In this formula σ and Σ are the standard deviations of the scores in the two groups and r and R the reliability coefficients respectively. In passing, it may be noted that this equation is an excellent criterion for determining whether a test is equally effective in a range Σ as in another range σ; for if the relationship just given does not hold within the probable error of the determination, it is evidence that higher correlation is found in one part of the range than in another.

[2] For the derivation of this formula see p. 377 at the close of the article.

In spite, therefore, of the very real merits of the coefficient of reliability, it does not permit of direct comparison in case the groups examined are of different ranges of talent.

VIb. The reliability coefficient may be used to determine a probable error of an individual score, and this measure is, of course, entirely independent of the range of talent upon which the calculation is based. It is, of course, desirable that this population be large enough so that chance errors will be small. Let x_1 and x_2 be the scores expressed as deviations from their respective means in two forms of a test; σ_1 and σ_2 the standard deviations of these forms (presumably practically equal); and r_{12} their reliability coefficient. Then if x_1-scores are estimated from x_2-scores, there will be discrepancies between the estimated x_1-scores and the x_1-scores actually obtained. These discrepancie are called residuals, or errors of estimate. The standard deviation of them is given by the following equation:[3] $\sigma_{1.2} = \sigma_1\sqrt{1-r_{12}^2}$. The probable error of estimate is $0.6745\,\sigma_1\sqrt{1-r_{12}^2}$. Usually, however, it does not particularly concern us to know how closely it is possible to estimate x_1-scores from known x_2-scores. The fact which we particularly wish to know is how closely we can estimate true scores (true scores defined as before, as the average scores which individuals would make if tested under similar conditions upon a very large number of such forms). The standard error in estimating true scores from x_2-scores is equal to $\sigma_1\sqrt{1-r_{12}}$. Otis and, more recently, Monroe have shown that this is also equal to $\frac{\sigma_D}{\sqrt{2}}$ in which σ_D equals the standard deviation of differences between $\frac{x_1}{\sigma_1}$ and $\frac{x_2}{\sigma_2}$ scores.

There are thus two methods (one involving the calculation of the correlation between tests and the other the calculation of the standard deviation of differences) whereby to calculate the standard error of estimate. The probable error of estimate is, of course, $0.6745\,\sigma_1\sqrt{1-r_{12}} = \frac{0.6745}{\sqrt{2}}\,\sigma_D$. The practical advantages in measuring reliability by the smallness of the errors of estimate lie in (1) their simple interpretation, and (2) their

[3] For the derivation of this formula see p. 379 at the close of the article.

independence of range of the talent examined; for if the test is equally excellent throughout a wide as a narrow range, except as influenced by chance, $\sigma\sqrt{1-r_{12}}$ for one range equals $\Sigma\sqrt{1-R_{12}}$ for a second range. Their disadvantage lies in the fact that they are dependent upon the units which happen to be those of the test, and direct comparisons of different tests cannot be made. If the probable error of estimate in the case of the Alpha reading test is 5 alpha units, and the probable error of the Beta reading test is 20 beta units, it is not known which is the more reliable until some equating of the units has taken place. Two methods of doing this are here proposed:

VIc. It is possible to define a group in such terms that a second investigator could approximately duplicate it, for example, "unselected English speaking twelve-year-olds." If the measure of dispersion of this group (say its standard deviation) is taken as the unit, and if errors of estimate are expressed in terms of this denominator, the reliability of tests claiming to measure the same capacity can be directly compared and the reliability of tests measuring quite different capacities can probably be compared with considerable validity and much significance.

VId. It is possible to define two groups, for example unselected children of two different ages, and to take the difference between the means of the two groups as the unit. The writer proposed at the February 1920 meeting of the National Association of Directors of Educational Research at Cleveland that the difference between the mean scores of unselected twelve-year-olds and thirteen-year-olds be accepted as a unit, and that the probable error of estimate of tests be expressed in terms of this unit. This has the very great advantage of being easily interpreted. If, for example, the probable error of the estimate of a test is 0.75 in terms of this unit, it means that the probable error of a placement of a child in the capacity measured by the test is 0.75 of a year's growth in the case of children twelve to thirteen; and that the probable error is in the neighborhood of the same amount in terms of years for children somewhat below or above this age.

Simplicity of interpretation strongly recommends this method, but inequality of rate of growth in different capacities makes direct comparison of different functions in terms of this unit not entirely sound. Furthermore, the probable error of the determina-

tion of this unit based upon a certain number of pupils of ages twelve and thirteen would be much greater than the probable error of a unit equal to the standard deviation of a distribution of the same number of 12.5-year-olds, as is apparent by reference to the formulas for the probable errors of these magnitudes. The age group twelve to thirteen is recommended because elementary, intermediate, and high-school tests can all be given to this age group, and because probably as large a percent of this age group are to be found somewhere in the school system as of any age group. Accordingly, if all twelve-year-olds in the school system are tested, a fair approximation to an unselected group is obtained.

This paper has been written with a view to showing the need of a standardized procedure in measuring the reliability of the tests which are in use, and with the hope that it will encourage such study and discussion as will lead to a unified practice. Whether the particular practice recommended is adopted is secondary to the establishment of a common procedure.

DERIVATION OF THE FORMULA, $\frac{\sigma_1}{\sigma_T} = \sqrt{\frac{r(1-R)}{R(1-r)}}$

Consider two forms of the same type of test, each designed to measure a given ability. Suppose that these two forms have been given to N pupils whose range of talent is narrow and to the same number of pupils whose range of talent is wide. Call the measures obtained from the first and second forms (expressed as deviations from the mean) the x_1's and x_2's respectively. Then r_{12} is the correlation between the two forms, or it is the reliability coefficient. Call the standard error of estimate of the x_1 scores from the true scores, $\sigma_{1.t}$. Then $\sigma_{1.t}^2 = \sigma_1^2 (1-r_{12})$.[4]

Similarly, when the two forms of the test are applied to the wider range of talent, we may write (designating the constants by capital letters)

$$\Sigma_{1.t}^2 = \Sigma_1^2(1-R_{12})$$

Now, if the test is equally effective in the wide and the narrow range of talent, then the two errors of estimate are the same and $\sigma_{1.t} = \Sigma_{1.t}$. Or, $\sigma_1^2 (1-r_{12}) = \Sigma_1^2(1-R_{12})$. Whence, dropping the subscripts,

$$\frac{\sigma_1}{\Sigma_1} = \frac{\sqrt{1-R}}{\sqrt{1-r}} \quad \text{.....Formula (1)}$$

Now, suppose that instead of having two forms of the test, we have n forms where n approaches infinity. Then the true measure of the ability of

[4] Cf. derivation (below) of the formula $\sigma_{1.2} = \sigma_1\sqrt{1-r_{12}^2}$

each pupil is the mean of his score obtained from the n forms. Then for N pupils and n forms, we have the following scheme:

Pupil	Scores Expressed as Deviations from the Mean				Mean or True Scores
	1st Form	2nd Form	3rd.....n^{th} Forms		
1	$x_1^{\,I}$	$x_2^{\,I}$	$x_3^{\,I}$	$x_n^{\,I}$	$\frac{x_1^{\,I}+x_2^{\,I}+x_3^{\,I}+\ldots\ldots x_n^{\,I}}{n}$
2	$x_1^{\,II}$	$x_2^{\,II}$	$x_3^{\,II}$	$x_n^{\,II}$	$\frac{x_1^{\,II}+x_2^{\,II}+x_3^{\,II}+\ldots\ldots x_n^{\,II}}{n}$
3	$x_1^{\,III}$	$x_2^{\,III}$	$x_3^{\,III}$	$x_n^{\,III}$	$\frac{x_1^{\,III}+x_1^{\,III}+x_3^{\,III}+\ldots\ldots x_n^{\,III}}{n}$
4	$x_1^{\,IV}$	$x_2^{\,IV}$	$x_3^{\,IV}$	$x_n^{\,IV}$	$\frac{x_1^{\,IV}+x_2^{\,IV}+x_3^{\,IV}+\ldots\ldots x_n^{\,IV}}{n}$
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
N	$x_1^{\,N}$	$x_2^{\,N}$	$x_3^{\,N}$	$x_n^{\,N}$	$\frac{x_1^{\,N}+x_2^{\,N}+x_3^{\,N}+\ldots\ldots x_n^{\,N}}{n}$

Since the "mean or true scores" are expressed as deviations, the mean squared deviation equals the sum of the squares of these scores divided by N;

$$\text{Or, } \sigma t^2=\frac{1}{N}\left[\left(\frac{x_1^{\,1}+x_2^{\,1}+x_3^{\,1}+\ldots.x_n^{\,1}}{n}\right)^2+..\left(\frac{x_1^{\,N}+x_2^{\,N}+x_3^{\,N}+\ldots.x_n^{\,N}}{n}\right)^2\right]$$

$$=\frac{1}{N}\left(\frac{\Sigma x_1^{\,2}}{n^2}+\frac{\Sigma x_2^{\,2}}{n^2}+\ldots.\frac{\Sigma x_n^{\,2}}{n^2}+\frac{2\Sigma x_1x_2}{n^2}+\frac{2\Sigma x_1x_3}{n^2}\ldots.\text{to }\frac{n(n-1)}{2}\text{ terms}\right)$$

$$=\frac{1}{n^2}\left[\left(\frac{\Sigma x_1^{\,2}}{N}+\frac{\Sigma x_2^{\,2}}{N}+\ldots.\frac{\Sigma x_n^{\,2}}{N}\right)+\left(\frac{2\Sigma x_1x_2}{N}+\ldots.\text{to }\frac{n(n-1)}{2}\text{ terms}\right)\right]$$

But $\frac{\Sigma x_1^{\,2}}{N}=\sigma_1^{\,2}$, $\frac{\Sigma x_2^{\,2}}{N}=\sigma_2^{\,2}$, etc.

And $\Sigma x_1x_2=Nr_{12}\sigma_1\sigma_2$

Whence $\frac{2\Sigma x_1x_2}{N}=2r_{12}\sigma_1\sigma_2$ and likewise for other paired values.

Hence $\sigma t^2=\frac{1}{n^2}\left[(\sigma_1^{\,2}+\sigma_2^{\,2}+\ldots.\sigma_n^{\,2})+(2r_{12}\sigma_1\sigma_2+\ldots.\text{to }\frac{n(n-1)}{2}\text{ terms})\right]$

But $\sigma_1 = \sigma_2 = \sigma_3$, etc.

Therefore, $\sigma_t^2 = \frac{1}{n^2}\left[n\sigma_1^2 + 2\sigma_1^2(r_{12} + r_{13} + \ldots \text{to } \frac{n(n-1)}{2} \text{ terms})\right]$

Since the series, $r_{12} + r_{13} + \ldots\ldots$ to $\frac{n(n-1)}{2}$ terms, may be replaced by the mean of its terms times the number of terms, $\sigma_t^2 = \frac{1}{n^2}\left[n\sigma_1^2 + 2\sigma_1^2 r \frac{n(n-1)}{2}\right]$

where r is the mean of the separate intercorrelations.

Whence $\sigma_t^2 = \sigma_1^2\left(\frac{1}{n} + r - \frac{r}{n}\right)$

But since n approaches infinity, $\frac{1}{n}$ and $\frac{r}{n}$ approach zero.

Therefore, $\sigma_t^2 = \sigma_1^2 r$.

By the same reasoning we obtain for the wider range of talent, $\Sigma_t^2 = \Sigma_1^2 R$. Substituting the values of σ_1 and Σ_1 as obtained from these equations in Formula (1), we have

$$\frac{\sigma_t}{\Sigma_t} = \sqrt{\frac{r\ (1-R)}{R(1-r)}} \quad \ldots\ldots\ldots \text{Formula (2)}$$

DERIVATION OF THE FORMULA, $\sigma_{1\cdot 2} = \sigma_1\sqrt{1-r_{12}^2}$

This formula may be derived as follows: Let x_1 equal the dependent variable and x_2 the independent variable. Then the formula for estimating the value of the dependent variable when that of the independent variable is known is $\bar{x}_1 = r_{12}\frac{\sigma_1}{\sigma_2}x_2$. (This, of course, is the usual regression equation. $\bar{x}_1$ is the value of the dependent variable obtained from the equation.) Letting x_1 stand for any obtained value of the dependent variable, $(x_1 - \bar{x}_1)$ is the error of estimate. The extent of this error may be expressed as the mean sum of the squares of expressions like $(x_1 - \bar{x}_1)$—in other words, by the square of the standard error of estimate. Calling this standard error of estimate $\sigma_{1\cdot 2}$, we have

$$\sigma_{1\cdot 2}^2 = \frac{\Sigma(x_1 - \bar{x}_1)^2}{N}$$

$$= \frac{\Sigma\left(x_1 - r_{12}\frac{\sigma_1}{\sigma_2}x_2\right)^2}{N}$$

$$= \frac{\Sigma x_1^2 - 2r_{12}\frac{\sigma_1}{\sigma_2}\Sigma x_1 x_2 + r_{12}^2\frac{\sigma_1^2}{\sigma_2^2}\Sigma x_2^2}{N}$$

But $\frac{\Sigma x_1 x_2}{N\sigma_1\sigma_2} = r_{12}$

Therefore, $\Sigma x_1 x_2 = N r_{12}\sigma_1\sigma_2$

Substituting for $\Sigma x_1 x_2$ its value, we have

$$\sigma_{1\cdot 2}^2 = \sigma_1^2 - 2r_{12}^2\sigma_1^2 + r_{12}^2\sigma_1^2$$

$$= \sigma_1^2(1 - r_{12}^2)$$

Therefore, $\sigma_{1\cdot 2} = \sigma_1\sqrt{1-r_{12}^2}$

Editorials

THE SCHOOL BULLETIN[1]

Educational workers in every section of the country were not only shocked but keenly disappointed when their eyes fell upon the first page of the December, 1920, issue of the *School Bulletin* and read these words: "This is the final number of the *School Bulletin*." This journal was founded by C. W. Bardeen of Syracuse, N. Y., forty-six years ago, and has been owned and edited by him since its establishment. It was a successful and influential educational journal. It was a profitable business enterprise. There are many who would have paid well for this paper, had they been able to purchase it. It would have been a good investment. Why did its owner discontinue it instead of passing it on into other hands?

The answer is that the action was thoroughly characteristic of the man who controlled it. The life of the *School Bulletin* is the life of C. W. Bardeen and the life of Mr. Bardeen is the life of the *School Bulletin*. For nearly half a century this journal was a leading factor in the development of the public educational system of the state of New York. Through this paper Mr. Bardeen expressed his opinion upon the educational problems of the day and especially upon those peculiar to the Empire State. The paper has stood out prominently as an expression of Mr. Bardeen's individual judgment on educational problems. His policy has always been to support educational measures and reforms which he believed would improve educational practice and procedure. When he favored a proposition he gave it whole-hearted support. When he opposed a measure he was equally whole-hearted in its condemnation. He maintained the same attitude toward men which he did toward measures. When he believed in a man, his support of that man was assured and proved a source of great strength. His censure of men in whom he did not believe was as severe as his pen could indite.

[1] At our request Doctor Thomas E. Finegan, State Superintendent of Public Instruction of Pennsylvania, contributed this fine editorial on the passing of a periodical whose long and influential career made its discontinuance an event in educational history.

Mr. Bardeen's educational philosophy was sound. He could be counted upon the right side of every great question. The *School Bulletin* will prove to be, in the years that follow, the most authoritative source on the history of education in the state of New York that will be found. This journal has made a large contribution to the development of American education. That contribution is Mr. Bardeen's individual achievement. He evidently wanted that achievement to stand as a memorial to his service. He refused to commercialize it. He is right, and should be commended for his decision. It required courage, but of all the numerous qualities in his character there was none more characteristic than his courageous spirit. The last issue of the *Bulletin* is proof of this fact.

The *Bulletin* will be missed by thousands of teachers to whose interests it was devoted. Its editor's versatility and sense of humor made the paper a professional companion. The editor put much of his philosophy of life into the paper and in this way cheered and encouraged thousands of teachers when the loads which they were carrying seemed almost overwhelming. The writer recalls a time many years ago when he had nearly decided to abandon educational work, but the persuasive arguments of Mr. Bardeen induced him to remain in it.

Having known Mr. Bardeen intimately for more than twenty-five years and having read the *School Bulletin* religiously for thirty-six of the forty-six years of its existence, I am able to place an appreciation upon its service and to express an estimate of the loss which the readers of the *Bulletin* will feel in the discontinuance of this live, interesting, and helpful journal. I can also assure Mr. Bardeen of the appreciation which men throughout the Union have of his service to public education and the sympathy and regret that they feel for the injury[2] which came to him and which makes it necessary to unload part of the burdens of his active and busy life. His philosophy is so sound and sane and is so well expressed in a personal letter which I recently received from him that I have obtained his permission to quote the following from that letter:

[2] In October, 1920, Mr. Bardeen, who is seventy-three years of age, suffered an injury to his right foot which necessitated amputation below the knee. The letter to Doctor Finegan, a portion of which is quoted below, was written in February, when Mr. Bardeen was convalescing after the operation.

"After six weeks in the hospital I have got back home, with a range at present of the chair and the bed. But this losing a foot is not so serious. I reflect a dozen times a day how much worse it would have been to lose a hand, and appreciate more and more how fortunate I am that it is below the knee. In college the boys used to sing:

'Saw my leg off,
Saw my leg off,
Saw my leg off—
Short!'

Like many undergraduate ambitions this showed lack of sagacity; it is much better to have it cut off long.

"I keep getting astonishing information as to similar losses that are unsuspected; the president of the City Bank, for instance, whom I know well and who never limps or carries a cane, has a wooden foot. I am promised my own artificiality shall be equally unnoticed, but unfortunately I can't get it attached until the skating season is over. There has been no pain worth speaking of, and though a hospital bed is tedious, since I have been allowed to sit up and read I have been quite comfortable, have had a good appetite, and am so well that the doctors agreed the other day that the rest had done me good and that I was the better for the operation. However, when I asked them if, when it did me so much good to have one foot off they advised me to saw off the other, they did not respond."

A BOOK OF INTERVIEWS

The Book of Cases which was recommended by the editor in the January issue as a means of studying methods of teaching is valuable. But cases observed and recorded with the care which he outlines are difficult to obtain. So, in the meantime, I propose a book of interviews which, while not as accurate as the case reports, will be of value as suggestions for the improvement of methods of teaching.

Teachers are much more willing to tell what they do than to describe it on paper. In every school system there are enough good methods to provide the inexperienced teachers with all they can use, methods which under normal conditions are buried in the individual minds of the teachers who use them and are, therefore, wasted so far as everyone except the owner is concerned.

Through the interview these methods become the common property of the system, for by the process of pooling, the individual possessions of each become the common property of all.

The plan of collection is very simple. It consists of four steps. First, the difficulties which teachers have must be selected with great care on both a quantitative and qualitative basis. It is important that these difficulties be made as specific as possible; and it is better to have the difficulties expressed in terms of the seventh grade or of the first grade than in general terms of the whole elementary school.

The second step is to select thirty or forty of the best teachers in the system who have successfully handled the selected difficulties. Here again seventh-grade teachers and first-grade teachers should be selected in connection with the seventh-grade problems and first-grade problems.

The next thing of importance is to train interviewers and detail them to find out and record how these successful teachers correct the difficulties in question.

Finally, the answers to each of the questions should be compiled and in such a way as not to lose the details. By such methods it is entirely practicable to obtain a number of valuable suggestions upon any topic upon which teachers have had expert experience.

These collected methods do not always have the certainty of established results; and occasionally different teachers use opposing methods. But, in some cases, the situation in which one teacher follows a method may not be identical with other situations in which it is desired to use it. Again, a teacher may tell what he thinks rather than what is the case, or what he ought to do rather than what he does. It must also be assumed that since the methods are not evaluated they are to be used as suggestions and not as established methods of procedure. But in spite of these shortcomings the collective experience of the best teachers in attacking a problem presents a mine of suggestions which are not all found in books. These methods are particularly valuable because they meet the concrete difficulties of the school room in concrete ways and are described by teachers in the vocabulary of the schoolroom.

W. W. C.

THE EDITORIAL BOARD, OR WHO CHANGED THE FRONT COVER

Our Editorial Board has engaged attention recently through its tendency to change itself. More recently and somewhat consequently we have been obliged to consider the topic suggested in the second part of our title.

We alluded in our News Department some months ago to the fact that Doctor Ayres had withdrawn from the directorship of the department of education of the Russell Sage Foundation. We hoped at that time that, although he was taking up financial work, his interest in education would seem to him to justify his continuing as an associate editor of the JOURNAL OF EDUCATIONAL RESEARCH. After taking the matter under advisement, however, he decided to resign. As a member of the board of editors, Doctor Ayres was particularly interested in the field of child accounting. His resignation, therefore, left an important department of educational investigation without adequate editorial supervision. At this juncture, however, Professor E. J. Ashbaugh, who is already a member of the board by virtue of his office as Secretary of the National Association of Directors of Educational Research, consented to give such attention to child accounting as might be required. We are very fortunate in securing the services of Doctor Ashbaugh for this purpose, and we feel sure that his willingness to assume double duty will be appreciated by our readers. Perhaps, however, those who are not members of the research association do not realize the extent of Doctor Ashbaugh's activities. We feel justified in suggesting to such persons that they look at the last few pages of each number of the JOURNAL and observe the competent way in which the department devoted to the association is being conducted.

As we announce the resignation of Doctor Ayres and the assumption of the department of child accounting by Doctor Ashbaugh, we also desire to announce that Doctor Guy M. Whipple, Director of the Bureau of Tests and Measurements of the University of Michigan, has accepted an invitation to become a member of the Editorial Board. As to a specialty, Doctor Whipple will naturally have something to do with tests; and so far as he does this, he will add his efforts to those of Doctor Monroe and Doctor Terman in this field. In a more general sense Doctor Whipple will undoubtedly bring strength to the

JOURNAL. His large editorial experience in connection with other journals and as secretary of the National Society for the Study of Education gives him a peculiar fitness for this type of work. The JOURNAL is exceedingly fortunate to be able to enlist the services of Doctor Whipple.

But we are neglecting our second topic. What we started out to say was, "Have you seen our new cover page?" Perhaps not. We suspect that a rather large proportion of our readers may belong to the tribe of the unobserving—to the domestically unsatisfactory clan who fail to notice a new rug on the living-room floor or new dishes on the dining table. If you belong to this clan, we fancy you will now turn back and note our new spring attire. However, we wish to express the hope that we shall have no more changes in our Editorial Board. The members of the board will naturally suppose this is because we value their services. Such is indeed the case, but we ask them to consider the fact that another resignation will necessitate another plate. Although the present changes have given us a chance to make a new appearance, we hope the members of the board as it is now constituted will stay with us indefinitely if for no stronger reason than to save the expense of engraving the names of their successors.

B. R. B.

Reviews and Abstracts

E. H. CAMERON, *Editor*

BURGESS, W. RANDOLPH. *Trends of school costs.* New York: Russell Sage Foundation, 1920. 142 pp.

This monograph shares with the monograph of Dr. Ayres on *An Index Number for State School Systems* a distinct position in the development of educational inquiry. Dr. Burgess' problem is evidently to give some fundamental information concerning the amount of increase which ought to be made in school budgets in order to secure the same amount of educational service as was obtained in years just prior to the World War. In order to do this he brings to bear the history of costs upon the problem.

Historical statistics are relatively new in education. Experience in that field has not been recorded in quantitative form and under uniform classifications for a long period of years. Accordingly, the important lessons which may be derived from "trends," as Dr. Burgess happily calls them, have been confined to those fields in

which practical workers as well as investigators early saw the need for systematic record-making. In economics, for example, we are able to trace the development of the volume of imports and exports in various countries, the fluctuations of wealth and taxation, the variations in birth, marriage, and death rates, the mutations of exchange rates and bank clearings, because practical business or the laws of civilized countries have a long time demanded that these data be reported in comparable form. If it is profitable in business to know the fundamental facts underlying business conditions and to know them in a time series, it is no doubt equally important to know in the same way the fundamental facts underlying education. In addition, therefore, to the definite and helpful facts which Dr. Burgess brings out in his book, we note with pleasure the success he has had in bringing to light a few significant items on which he can furnish evidence over a long period of time. In the first place, he shows the fundamental facts of children in attendance and of expenditures for education in the public schools of the country since 1870. He brings out graphically the development of these items in this half century by means of trend lines, or lines of closest fit to the detailed curve.

Observing that expenditures for salaries (including wages) and outlays for sites, buildings, and equipment constitute about 80 percent of the total school expenditures, and that salaries alone constitute nearly two-thirds of the total, he concludes that the investigation of the trend of salaries is decidedly the most important investigation in school expenditure. He is able to carry this inquiry over a period of 80 years, using quotations (twenty per year) for the same localities. During this period—1841 to 1920—weekly salaries increased as follows: for men teachers in rural schools, from \$4.15 to \$26.75; for women teachers in rural schools, from \$2.51 to \$17.68; for men teachers in city schools, from \$11.93 to \$60.61; and for women teachers in city schools, from \$4.44 to \$35.61. During the past five years teachers' salaries (all types of service combined) have increased 45 percent. These increases are large, but as a matter of fact, they substantially parallel the increases during the past five years for laborers and artisans.

On the basis of the weekly budget of a typical wage-earner's family the curve for the cost of living was plotted for the same period. From about 1875 to 1915 teachers' salaries were a little above the cost of living. From 1915 to 1920 the situation was reversed, and the cost of living not only passed the teachers' salaries but increased twice as rapidly. "In 1918 and 1919 the teacher could buy fewer of the necessities of life than at any time in 40 years. The situation is improved in 1920 but the same statement may still be made truly. The considerable advances in teachers' salaries within a year have thus far brought them back only about two-thirds of the distance that they fell." The author adds, "There seems good reason . . . . to believe that adequate adjustment to new price levels will be made. It should be realized, however, that only a good beginning has been made in effecting that adjustment. The major part of the task is still to be carried through."

With further reference to the relation of the salaries of teachers to the wages of artisans and laborers, the author points out that since 1915 the average wage of artisans and laborers has increased twice as much as that of teachers, and that "in relation to the laborer the average woman teacher was in 1918, 1919, and 1920 less well off financially than at any other time since the Civil War." It is thus evident that from the two important points of view of cost of living and the wages of other workers, the standard of living among teachers is not as high relative to that of others in gainful occupations as it has been in the past.

Dr. Burgess also investigated the trend of building costs. Summarizing his findings, he concludes that "in spite of considerable economies school buildings . . . are actually costing fully three times as much as before the war."

Thus the author brings from afar an overwhelming weight of evidence to bear upon his conclusion, which is essentially that "the same items of school expenditure will cost roughly twice as much in 1920 as in 1915." He notes in this connection that this statement "does not allow for any increase in school efficiency, or in school accommodations." He might have added—and did in fact imply—that it does not allow for any increase in school population. On the point of whether prices and wages will fall the author had recourse to his experience sheets as developed for the past 80 years. He observes that after the Civil War prices receded very slowly, and concludes that we may expect some lowering of price levels within the next few years "but no return to pre-war conditions for many years if at all." As to wages and salaries he shows that after the Civil War "some wages receded a little but only after several years" and points out that "wages and salaries retain advances made." "At present," he says, "it is reasonably certain that a new salary level has been reached which is likely to be permanent. The experience of the past supports this reasoning, and today the factors making for the permanence of salary and wage increases are more powerful than ever before." His conclusion, therefore, that school budgets must be double the size of those of 1915 errs, if at all, on the side of conservatism.

As to the way in which this is to be done, Dr. Burgess has an exceedingly interesting final chapter entitled "Sources of Income." He points out that other sources of revenue than general property tax are either relatively non-productive or have been utilized as far as safety permits. Moreover, he asserts that present needs cannot be met by adjustments in city budgets. Other types of public service "cannot give way further for the expansion of education." It is his judgment not only that the real estate tax is the soundest provision for revenue but that in spite of large increases in the tax rate in recent years, there are no indications that the limit which real property can bear has been reached.

We find Dr. Burgess' book not only distinctive in its treatment of educational data but timely in the lessons it draws from the past for our guidance in the present.

B. R. B.

Proceedings of the High School Conference of 1919. (University of Illinois Bulletin Vol. XVII, No. 13) Urbana, Illinois, 1920. 313 pp.

A review of the *Proceedings of the High School Conference of November 20, 21, and 22, 1919* probably seems to be somewhat late. However, the unusual merit of a number of the contributions to secondary education recorded in the 1919 Proceedings justifies the publication of some comments at this time.

Professor H. A. Hollister, director of the conference, opened the 1919 session with a discussion of the general conference objective, "The Universalization of High School Education for the Children of All the People in Illinois." During the past few months there has been a great deal of discussion of the importance of high-school objectives as a means of assisting in curriculum reconstruction. A commission appointed by the National Education Association has set forth in a bulletin entitled "Cardinal Principles of Secondary Education" seven main objectives: health, command of fundamental processes, worthy home-membership, vocation, citizenship, worthy use of leisure, and

ethical character. Serious students of the problems of curriculum reconstruction will be interested in comparing with these seven objectives the four ultimate objectives proposed to the conference by Mr. Sandwick's committee, namely, health, wealth, association and beauty, the fundamental essentials to economic, political, and social life.

Probably the real life and spirit of the conference is developed in the section meetings. Certain it is that that part of the 1919 Conference Proceedings devoted to "Section Meetings" is unusually full of valuable contributions. In practically every section considerable attention was given to the discussion of the value of objectives as a means of curriculum reconstruction.

In the Administrative Section Mr. A. G. Capps, University of Illinois, presented an excellent article on the technic of curriculum construction. Seven general rules, formulated by Dr. Charters, were set forth as guiding principles. Mr. Capps has presented in his paper an analysis of the four ultimate objectives of secondary education as set forth by Principal Sandwick's committee.

High-school principals and teachers of the social sciences will be interested in reading Professor Judd's paper on social studies in the high school, presenting difficulties in the way of the introduction of social studies, together with a constructive program for the introduction of such studies.

Every year sees great progress in the application of scientific methods to the problems of education. Personal opinion is rapidly being replaced by decisions based on the scientific measurements of facts. In an article on "Intelligence Testing for the Classification and Guidance of High School Pupils" Professor Buckingham has pointed out the need and importance of intelligence tests. School superintendents and principals will be interested in the list of available group tests which Professor Buckingham has listed.

The "Project Method" of teaching probably has been more successfully used in agriculture than in any other subject. In fact, there are many who have come to the conclusion that the "Project Method" is one that has little value except in agriculture. A large part of the agricultural program was devoted to presentations and discussions of various projects. Perhaps the most successful of the high-school agricultural projects thus far reported is the project "An Experiment on Profit from City Bred Pigs" which has been carried on by R. W. Sutherland, a student in the Galesburg High School. Agricultural teachers will not only be interested in these various "projects," but they will find a valuable contribution on "The Point of View of the Teacher of Vocational Agriculture" by Professor G. A. Works of Cornell University.

In the Biology Section there seemed to be general agreement that the time has come for a rather complete reorganization of the course of study in biology. Much of what has been taught in biology in the past is not essential for high-school students. The present pressure for time requires the elimination of all non-essentials. Mr. H. D. Waggoner, Macomb, stated some of the difficulties in the way of reorganization and gave a clear presentation of the essential objectives in biology. Every teacher of zoology should read Miss Mabel E. Smallwood's contribution on "Fundamentals in a High School Course in Zoology." The points brought out in this paper are prerequisite to effective teaching in this field. Mr. J. L. Pricer presented a paper on "The Outlook for Biological Science in the Reconstruction of Secondary Education." There is included in the Proceedings Professor J. M. Coulter's talk on "Botany as a National Asset."

It seems unnecessary and out of place in a brief review to discuss in detail all the many valuable contributions to the various sections. It would be a mistake, however, to omit mentioning Arthur Bovee's "Teaching Vocabulary by the Direct Method," one of the most valuable contributions to the Modern Language Section for several years. The technic of teaching modern language has been radically changed since the general introduction of French during the World War. We hear much discussion of the "Direct Method." Mr. Bovee, University of Chicago High School, is a master in the use of this particular type of technic. Every teacher of French will find valuable aid in Mr. Bovee's article.

In general, the 1919 *Proceedings of the High School Conference* represents the most modern educational theories and the practice of teachers and administrators who are making a success in the educational field. Every teacher, principal, and superintendent will find material in the 1919 Conference Proceedings relating to his own special interest.

A. W. CLEVENGER

University of Illinois

BONSER, FREDERICK GORDON. *The elementary school curriculum*. New York. Macmillan Company, 1920. 460 pp.

A third book on the elementary school curriculum has appeared and reaffirms a "genuine need for a thoroughgoing, constructive revision of the curriculum." Other books or studies with a similar purpose are already in the making. All these studies are most welcome.

Professor Bonser acknowledges that a curriculum organized wholly upon a basis of *activities of life* is desirable, but recognizes that the present curriculum is thoroughly established upon a subject basis. An abrupt change would be impracticable, he maintains, and, therefore, he offers in his book "a mode of natural transition."

The first eight chapters are devoted to principles in curriculum making. In the next nine chapters the application of these principles is described. The concluding chapter tells how this book may be used in improving curricula. The first eight chapters center about the project method, especially discussed in chapter VI. "A project is a purposeful act. . . . The project method holds that the desirable and interesting life activities in which children spontaneously engage, or the activities in which they may be led to engage whole-heartedly and enthusiastically, should be the basis of all educational endeavor." The curriculum must thus be very closely related to life purposes and life activities.

In chapters IX to XIII and chapter XVI, Professor Bonser presents "projects" that may be used in each of the first six grades in teaching the school subjects, practical arts, geography, arithmetic, history, English, and physical education and hygiene. Such projects are not outlined for fine arts, music, and citizenship in the other three chapters in which these subjects are discussed.

This book will appeal strongly to the thousands of teachers into whose hands it will go—and go it will, because the title of this book interests thousands of grade teachers. And the book will contribute—somewhat—to progressive education.

To compromise between a curriculum that is "ideally desirable" and one that needs "thoroughgoing, constructive revision," is not the constructive contribution desired of our educational leaders. Our modern science of education is weakened by

such procedure. That an *abrupt* change from a curriculum of school subjects to a curriculum of life activities is neither desirable nor feasible need not forbid an educational leader proposing a definite program according to his very best standards. Adaptation to present conditions is another problem. Professor Bonser grants that a curriculum based on activities of life is desirable. He presents a "mode of transition," but leaves the reader in ignorance of the real curriculum to which such transition leads. This compromise leads to other weaknesses.

The project as a purposeful life activity, in which children engage whole-heartedly and enthusiastically, is debased, by this compromise, to essentially a *device* for teaching the schoolroom subjects. Just here Professor Bonser (and many other recent writers on phases of the "project method") pours new wine into old bottles with evil results. Current life activities *teem* with interest to the normal child. This situation the author recognizes. But the schoolroom subjects do not thus appeal to the child. What can be done? Eureka! Use the former as a means of teaching the latter. *And it works!* Note the "arithmetic" given by the author on pages 246–247, 248, 249, for grades IV, V, and VI respectively. Note how closely this "arithmetic" corresponds with that prescribed in most schools. Now examine the projects which the author lists in connection with the arithmetic. How strikingly evident that the "project," "a purposeful act," is used by the teacher as a method—a bait—by which to ensnare the interest of pupils and fasten it, for the time, upon that in which he has no normal interest. Professor Bonser's presentation of the project and its use in teaching the traditional school subjects stamps this book as a manual of method rather than a study of the curriculum.

The author's desire to compromise through a "mode of natural transition" has led him to some apparent contradictions. In chapter VI emphasis is placed upon a curriculum of purposeful activities—projects. The sequence of projects, he says, is determined by the interests and capacities of the pupils, and cannot be in accordance with a logical organization of school subjects. "*There are no life activities in subject matter as such*" (105). So far, so good! But in later chapters the traditional order prevails, as in the chapter on arithmetic: ". . . . the sequence found in the usual text books in arithmetic will be approximated" (241).

Had the book been entitled "The Project Method Applied to the Traditional Curriculum," and the best part of chapter VI omitted, teachers would have had a very substantial and popular manual on *one method* of teaching. In that case the book would have been free from the adverse criticisms I feel bound to offer. The book will be generally well received. It will call forth more study on the "project method," on projects, on methods, and perhaps on the curriculum.

University of Missouri J. L. MERIAM

TURNER, E. A. *The essentials of good teaching.* New York: D. C. Heath & Co. 1920. 263 pp.

Three distinctly different aims have determined the organization and content of recent discussions of methods of teaching. Some writers are interested primarily in telling teachers how to conduct recitations effectively. Consequently their discussions are full of helps, outlines, devices, and concrete suggestions concerning the best ways of securing desired results. A second group of writers are interested in reviewing the results of experimentation, and in interpreting these results in terms of

economical classroom procedure. A third group of writers believe that improvement in the art of teaching can be secured most effectively only when teachers have a thorough grasp of the basic principles of good teaching. They therefore center attention on those principles which underlie and explain the best practice. Each type of discussion makes a distinct contribution. The most helpful type for classroom teachers is one which utilizes fundamental principles, the results of experimentation, and concrete devices in the discussion of specific problems.

Professor Turner in *The Essentials of Good Teaching* aims "to lay bare the essentials of good teaching in a simple, concrete, and consistent manner in order to conserve the time and energy of teachers who are anxious for intelligent guidance in their teaching." At the very outset, he presents a comprehensive view of the prerequisites to a successful teaching act. These include a clear recognition of the social aim of education, the function and structure of subject matter, a knowledge of the reactive attitude of the child, a knowledge of appropriate stimuli, skillful control of stimuli, and enthusiasm for teaching. The essential points which are discussed agree very closely with the most progressive tendencies of the times. Each point is well supported by social, psychological, and philosophical considerations. More frequent reference to recent experimental results would have added materially to the objectivity of these discussions.

Along with the discussion of fundamental principles, considerable attention is given to concrete illustrations and applications. The discussions of the value and methods of comparison, the application of principles to reading, primary arithmetic, writing, and spelling, and the use of tests in improving instruction are especially pointed and effective. Inasmuch as the author has a wealth of concrete illustrations at his command, it is somewhat unfortunate that additional space was not available for a larger number.

The book centers attention on fundamental principles and stimulates independent thinking concerning the most significant classroom problems, and is probably best adapted to the needs of experienced teachers. It supplies a safe and sane philosophy of teaching, and can be used as a safe guide in reorganizing many phases of current instruction. On account of its simple style and its wealth of detail, the book is easily read and understood.

W. S. GRAY

University of Chicago

McGREGOR, A. LAURA. *Supervised study in English.* New York: Macmillan Co., 1921. 220 pp.

The substance of this new book for supervisors and for teachers of English consists of many lessons, intrinsically interesting and highly suggestive, reported minutely from the practices of the English department of the Washington Junior High School, Rochester, New York. The writer, herself the supervisor of English and director of vocational guidance in the school named, reduces mere theory and pedagogical discussion to a minimum; she rests her case primarily upon an imposing array of concrete material, which she treats as illustrative of several innovating principles in the teaching of the mother tongue. Three principles apparently are uppermost in the author's conception: (1) abolishing the formal recitation and for it substituting laboratory procedure full of purposeful activity on the part of the pupils; (2) managing

the assignment of laboratory tasks so that each pupil, be he of low, of average, or of high ability, will be constantly working at his own maximum; (3) utilizing to the full, through socialized recitations and project teaching, the cooperative group impulses of adolescent children in grades VII, VIII, IX. In short, Miss McGregor has utilized the title *Supervised Study in English* in a somewhat larger sense than the one in which it is usually employed.

The first two chapters develop the meaning of supervised study as it has been set forth by McMurray, Erhart, Hall-Quest, and others, and apply it with special reference to the problems of English. Then in order follow chapters on oral English, on literature, on composition, on grammar, on special kinds of skill in English, and on the use of projects in English. Each chapter contains from five to ten sample lessons; for instance, chapter III on oral English contains among others a seventh-grade lesson in correct speech, an eighth-grade lesson in vocabulary building, and a ninth-grade lesson in library reference reading. Each lesson is divided into parts, review, assignment, and silent study predominating, with verification and socialized lesson appearing in some cases. To each of these parts is allotted a portion of the sixty-minute period appropriate to the subject matter concerned; the review is short, usually from ten to twelve minutes; the assignment varies greatly in length, from thirteen to thirty minutes, and averaging 40 percent of the class time; the silent study averages about twenty minutes.

One of the significant features of the lessons for students of education is the large variety of situations in which assignments are worked out on the basis of minimum, average, and maximum difficulty, together with a report in nearly every case, of the number of children who in the respective lessons were able to fulfill the different assignments. Minimum and maximum assignments are met usually by a minor part of the class; the average assignment by the greater number of the pupils. This distribution is not uniform, however. The pupil grouping in one VIIIA lesson in vocabulary building was minimum 4, average 13, maximum 18; evidently an easy lesson.

One who believes that the day of the formal recitation is past will find abundant comfort in the apparent reasonableness of Miss McGregor's contributions. He will find individualization of instruction, pupil initiative, project teaching, socialized recitation—in short, the laboratory emphasis and procedure—exemplified and illustrated in a hundred different ways. When these principles are applied universally, as apparently they are applied in Miss McGregor's English department, a new day will have come in the teaching of the mother tongue.

R. L. LYMAN

University of Chicago

News Items and Communications

This department will contain news items regarding research workers and their activities. It will also serve as a clearing house for more formal communications on similar topics, preferably of not more than five hundred words. These communications will be printed over the signatures of the authors. Address all correspondence concerning this department to Walter S. Monroe, University of Illinois, Urbana, Illinois.

Schoolmen's Week at the University of Minnesota

During the week of March 22 and March 26 a number of educational groups met at the University of Minnesota. The most important events of this meeting were the Eighth Annual Short Course for Superintendents and Principals, and the Fifth Annual Conference of Minnesota High School Teachers. In addition to local talent Professor E. L. Thorndike, Dean J. W. Withers, and Professor Charles H. Judd contributed to the program.

Michigan Conference on Educational Measurements

The Bureau of Tests and Measurements of the University of Michigan held a conference at Ann Arbor on the evening of March 29. The program was devoted to the consideration of one topic: "The Classification of Pupils on the Basis of Intelligence Tests." School men from eleven Michigan cities were scheduled to make formal formal reports on this topic.

Educational Research in Ohio

A bulletin of the Research Department of the Ohio State Teachers' Association for March, 1921, gives a list of the studies recently completed, or now in progress by 46 members of the department. Of these studies, 45 are reported as completed and 88 as in progress. If the large number of studies reported as being in progress are carried to completion the reports of this association will make a large contribution to our accumulation of knowledge in this field. The report is sent by Professor R. L. Morton of Ohio University, Athens, president of the department, and Superintendent F. J. Prout, Chillicothe public schools, secretary of the department.

Educational Research in Wisconsin

The following program was announced for the joint meeting, on March 11, of the sections for educational measurements and for grammar grades of the Southern Wisconsin Teachers' Association.

What About Grammar? Superintendent E. G. Doudna, Wisconsin Rapids—30 minutes. *Discussion*—Professor F. L. Clapp, University of Wisconsin—15 minutes.

Utilizing Intelligence and Achievement Tests for a More Effective Technique in Arithmetic—H. A. Cook, Principal of Junior High School, Merrill—25 minutes.

Individualization of Instruction in Algebra and Elementary Mathematics—Mary A. Potter, Racine High School—15 minutes.

Improvement in Comprehension in Silent Reading—Prudence Cutright, Supervisor of Primary Grades, La Crosse—25 minutes.

Variability of Improvement in Spelling—Rose Gagen, Janesville—15 minutes.

Dean M. E. Haggerty of the University of Minnesota addressed the meeting of the association on "Service of General Intelligence Tests."

Educational Research in China

We continue to receive from China evidence of unusual interest in educational and intelligence tests. This interest is shown not only by the resident American teachers, but also by the native teachers. We received a letter a few days ago from Professor H. C. Chen of the Nanking Teachers College. Professor Chen says in part:

"Dr. S. C. Liao and myself have been working on educational and mental tests for the last year and a half. A book on mental tests will appear in Chinese in two months' time. It embodies thirty-five different tests. Eleven of them are our own work, and the rest are translations with modifications. Practically all of the tests have been tried in the Chinese schools, missionary or government. This work is of course tentative, but we hope to standardize these tests as time goes on.

"In addition, I have devised a number of Chinese language tests such as language completion tests, dictation tests, opposites tests, etc. As a preliminary step we used five tests for the last entrance examination of our college. The correlation between the tests and the average grades of the regular examinations was 0.39. It might have been higher, had we excluded the marks of the students in mathematics and Chinese language which, as I was told by the Dean of the College, were unscientifically graded and too difficult for the candidates."

Professor Chen enclosed with his letter a number of tests such as he is using. In addition to analogies, opposites, language completion, etc. there was a spelling test. We had supposed that the Chinese did not spell, yet here there are apparently—"apparently" is used with something more than common significance—twenty timed sentences. We are at least sure that there are twenty items of some sort.

A Bibliography of Educational Tests

The World Book Company has recently issued a brief bibliography of educational tests. Two hundred seventy-eight titles are listed. It is significant that a commercial firm has considered it worth while to compile such a bibliography. The World Book Company has rendered a distinct service by compiling and publishing this bibliography.

An Index Number in a State Survey

The influence of Dr. Ayres' method of investigation by means of an index number is seen in a monograph by Thomas E. Benner, statistician for the Alabama State Department of Education. The monograph is entitled, "A Comparative Study of the Elementary Schools, White and Colored, of the Sixty-seven Counties of Alabama." Ten items are used in appraising the schools of each county, and when the entries under the items are averaged, the general index number ranges for the sixty-seven counties from 38.0 to 75.2. The text accompanying the tables and charts purposely avoids technical terms and leaves the reader to draw his own conclusions. Mr. Benner says of the report: "So far as I know, this is the first time that both the white and colored schools have been measured—if the material of this study be accepted as a measurement—in terms of the same units for an entire state." We know of nothing to the contrary.

Progress Tests in Arithmetic

Houghton Mifflin Company announces a series of five tests under this title. They were devised by Harriet E. Peet, co-author of "Everyday Arithmetic," and Walter F. Dearborn, Professor of Education, Harvard University. There is one test on each of the four fundamental operations. The fifth is a problem test. In each test there are several different types of exercises and they appear to be arranged in order of increasing difficulty. No measure of the rate of work is obtained. The authors state that the tests include the "leading difficulties that the pupils need to master." The tests are intended to supplement rather than to replace the tests of the type of Courtis Research Tests in Arithmetic, Series B, which yield measures of rate.

Directions for Scoring the Burgess Reading Scale

When the Picture Supplement Reading Scale by May Ayres Burgess appeared, it was obvious to those who had had wide experience with educational tests that detailed directions for scoring would be necessary if a high degree of objectivity was to be secured. No such directions were furnished by the author. Recently the Bureau of Tests and Measurements of the University of Michigan, which is supervising the use of this scale in Michigan, has issued a set of detailed directions for scoring it. These will doubtless be welcomed by all of those who have attempted to use the scale.

Provision for Schooling the Immigrant

The Carnegie Corporation of New York has recently published the result of the Americanization studies to determine the provision for teaching English to non-English-speaking foreigners in our public schools. The following statements are quoted because they have a general interest:

"If an immigrant from a non-English-speaking country chooses to learn English in the public schools here, he must select with care the place of his residence in this country, for only one city in five has any public-schooling provision.

"It is evident from the statistics gathered that his chances of finding a school in any urban community increased 40 percent from 1914–1915 to 1918–1919; but he also has an eight times better chance if he goes to a place having more than 1,000 foreign-born residents than if he goes to one having less than that number.

"If he will also pick out a place having a population of over 25,000, he will have about seven chances in ten of finding public-schooling provision; on the other hand, he has one chance in ten in a town of less than 10,000 population."

Institute of Educational Research

At the Alumni Dinner held in connection with the meeting of the Department of Superintendence at Atlantic City, Dean James E. Russell announced the establishment by the Trustees of Teachers College of an Institute of Educational Research. For the first time in the history of American education, the scientific investigation of education is to be undertaken on a basis comparable to that enjoyed by the research foundations devoted to science, engineering, and medicine.

The Institute is to be organized with Professor E. L. Thorndike as the Director of the Division of Educational Psychology, Professor Otis W. Caldwell as the Director of the Division of School Experimentation, and Professor George D. Strayer as Director of the Division of Field Studies.

The work of the Institute is to be supported by funds provided by the Trustees of Teachers College and by gifts supplied either by way of general endowment or for the purpose of conducting particular investigations. Funds have already been provided by the General Education Board for the work of the Lincoln School which will be a very important part of the Division of School Experimentation. This part of the enterprise is well under way under Dr. Caldwell's direction in the Lincoln School of Teachers College.

The Commonwealth Fund has made a grant in support of an inquiry concerning methods of learning. This investigation will be undertaken during the next year by Professor Thorndike. From the same source funds have been provided for a study of financing of American city school systems. This inquiry is undertaken in co-operation with the Committee for Chamber of Commerce Cooperation with the Public Schools under Professor Strayer's direction.

Relationship Between General Intelligence and Success in Certain High-School Subjects

During the school year 1919–1920, the writer gave the Alpha Army Test to the high-school students of the Omaha high schools. Significant intelligence differences were found among the three high schools. This was particularly true of Central High School and High School of Commerce where a difference of from 20 to 30 points between corresponding classes was found. These differences, as well as differences in social status and curricula of the two high schools, were pointed out in an earlier article in this JOURNAL.[1] Central High, it was found, received most of the students from the well-to-do and professional classes for classical and college preparatory courses; while Commerce High received most of the students from the laboring and less well-to-do classes for vocational training. The striking differences in the curricula of the two schools may be seen in the subjects listed in Table I.

With the differences mentioned above in mind, the writer considered two questions: (1) Do certain high-school subjects require greater general intelligence of the type measured by the Alpha Army Test than others? (2) Do the students less endowed in that type of intelligence do effective work in vocational subjects? To answer these questions the marks were given at the end of the first semester, 1920, obtained from both schools for the students who had been given the Alpha Test. The median intelligence score for the students who failed and for those who received passing marks was then found. This was done for a number of school subjects, and for the boys and girls of each class separately. The results appear in Table I.

From this table, it appears that greater intelligence is required for success in the subjects taught in Central High than for success in the subjects taught in Commerce High. It also appears that differences in the degree of intelligence required for success exist for the subjects taught within each school. In Central, Latin holds first place throughout the four classes. In the same school, manual training, mechanical drawing, typewriting, and bookkeeping are at the bottom in the classes in which they are given. The same consistency does not appear for the vocational subjects taught in Commerce High, although there is a tendency for typewriting and bookkeeping for the boys and sewing and cooking for the girls to occur at the bottom of the list. From this

[1] Madsen, I. N. "Group Intelligence Tests as a Means of Prognosis in High School," *Journal of Educational Research*, 3:43-52, January, 1921.

table it seems fair to conclude that general intelligence as measured by the Alpha Test is an important factor in a high-school pupil's success or failure. No doubt the results in these tables would have been more striking if other factors contributing to a student's success (such as emotional traits, school attendance, home conditions, etc.) were constant for all pupils.

TABLE I. COMPARISON OF MEDIAN INTELLIGENCE SCORES IN ALPHA ARMY TEST OF CENTRAL AND COMMERCE HIGH-SCHOOL STUDENTS FOR CERTAIN SUBJECTS SHOWING MEDIAN FOR PASSING AND FAILING STUDENTS

	Boys		Girls	
	Median Scores of Failed Students	Median Scores of Passed Students	Median Scores of Failed Students	Median Scores of Passed Students
Freshman (Central)				
Latin I and II	109.2	124.2	107.1	122.5
Ancient History I and II	97.3	120.8	91.0	117.1
English I and II	97.0	118.8	86.7	108.7
Algebra I and II	101.8	113.2	91.0	113.9
Manual Training	.....	102.7	.....	.....
Mechanical Drawing	100.0	101.0	.....	.....
Household Arts	.....	.....	87.5	98.2
Freshman (Commerce)	.....	.....	.....	.....
Typewriting	70.0	100.0	80.0	88.1
Mechanical Drawing	76.0	93.0	.....	.....
Woodworking	64.0	85.3	.....	.....
Telegraphy	70.0	74.0	.....	.....
Rapid Calculation	.....	.....	60.7	86.0
Sewing	.....	.....	70.0	86.7
Cooking	.....	.....	77.5	75.2
Sophomore (Central)				
Latin III and IV	140.0	144.2	128.3	133.2
Geometry I and II	109.2	134.4	106.4	127.0
Biology I	112.5	133.7	101.7	122.6
English III and IV	114.0	131.2	96.2	125.0
Mechanical Drawing	.....	127.5	.....	.....
Household Arts	.....	.....	.....	108.7
Sophomore (Commerce)				
Algebra, Science and Math.	70.0	107.0	.....	.....
Typewriting	80.0	100.0	90.0	91.8
Bookkeeping	100.0	100.0	82.5	91.8
Cooking	.....	.....	80.0	94.0
Sewing	.....	.....	80.0	89.0

TABLE I—*Continued*

	Boys		Girls	
	Median Scores of Failed Students	Median Scores of Passed Students	Median Scores of Failed Students	Median Scores of Passed Students
JUNIOR (CENTRAL)				
Latin III and IV	142.5	146.5	.....	.....
Latin II, III, IV, V	.....	.....	130.0	139.7
English V and VI	129.0	140.5	106.6	134.1
Amer., Anc., and Eng. Hist.	126.6	139.2	110.0	140.0
Algebra III	.....	138.0	100.0	133.0
French I and II	131.2	133.6	125.0	135.8
Physics	.....	133.6	.....	.....
Household Arts	.....	.....	.....	115.0
JUNIOR (COMMERCE)				
Mechanical Drawing	102.5	106.3	.....	.....
Typewriting	90.0	106.0	105.0	98.9
Bookkeeping	.....	95.0	60.0	113.7
Stenography	.....	.....	87.0	99.0
SENIOR (CENTRAL)				
Latin V, VI, VII, VIII	.....	1[illegible]8.9[a]	112.5	150.0
French and Latin	130.0	1[illegible]4.3	.....	.....
English VII and VIII	.....	147.5	.....	138.1
Chemistry	127.5	146.6	.....	138.0
Algebra III, Geometry and Trig.	90.0	146.6	.....	.....
American History	125.0	141.4	111.6	136.6
Bookkeeping	.....	135.0	.....	132.5
French II, III, IV	.....	.....	117.5	147.1
Household Arts	.....	.....	.....	125.5

[a] Includes Juniors and Seniors.

In answering the second question the school marks given in the two high schools were studied. The same marking system is used in both schools. The distributions of marks show that a much smaller percent of pupils failed in the Commerce High than in the Central High. Thus, either the standards for success are relatively lower for the vocational subjects taught in Commerce High or a less degree of intelligence is required for success in them.

The results obtained in this investigation would suggest the desirability of testing prospective high-school students as to their capacities before choosing the subjects which they attempt. There must inevitably be many misfits by our present empirical method. Intelligence tests have not yet been brought to the point of infallibility, but if skillfully used they can be of great service. It would, of course, be desirable to have a test which would measure capacity for vocational subjects in the same way that the Alpha Test measures capacity for the classical subjects. This would provide a positive means rather than a negative means of selecting pupils for vocational training.

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A Social Survey of the Needs in Current Reading

Dr. Walter R. Smith in "An Introduction to Educational Sociology," names four specific means of socializing the curriculum in our schools. These four means are, the elimination of the material least useful; the addition of wide ranges of knowledge demanded but not now included in school courses; the organization of this new material in harmony with the old into a well-rounded program; and the socialization of the methods of teaching the reorganized material. Professor Smith further says: "For both eliminations and additions the social survey is necessary. In just what subjects, and in just what materials in these subjects, has society a right to expect that the pupils leaving a school will be proficient? This can be determined only by learning what the larger society which the children are about to enter demands of its mature citizens."

The problem of this survey was to discover the lines of study (and their relative proportion) which are necessary for reading our weekly magazines intelligently.

The Independent was taken as a typical American weekly and a survey of this magazine for one year was made. The method of investigation was to record data concerning the amount of attention paid by *The Independent* to the various topics it discussed. Fifty-two copies of the magazine were examined and the number of columns given to the various topics tabulated. The results are shown in Table I. The classifications were purely arbitrary. It was impossible to avoid a certain amount of overlapping of the various lines of study, since there is no sharp line of demarcation within facts which may be classified equally well as belonging to economics, sociology, history, and civics. The study was made before the war and the conclusions are such as would apply to normal times.

In the fifty-two issues we find that 583 columns were devoted to modern political history. Under this heading were discussed political situations in foreign countries, wars, treaties, revolutions, peace negotiations, and diplomatic relations. Since the war this kind of reading will continue to be far bulkier than ever before.

Next in importance is the study of economics, covering 462 columns. Important topics discussed are: business, finance, currency, stock exchange, cost of living, tariff, income, corporation matters, inheritance tax, capital and labor, interstate commerce.

American civics and politics occupy 410 columns. The leading topics discussed are: state and national legislative measures, political parties, elections and appointments, women's suffrage, administrative measures, government ownership, municipal government.

Next comes sociology with 325 columns. The main topics are: great interests which make up American life, social organization, social service, development of community life, the care of defectives, immigration, the race question, women's clubs.

The space occupied by each of the other topics is given in Table I, and their scope is indicated in a general way by the captions. The total number of columns is 3,910.

These various topics readily group themselves under five main heads: (1) cultural, with 1,337 columns, including fine arts, biography, education, fiction, religion, ethics, humor, and poetry; (2) political, with 993 columns, including modern political history and American civics and politics; (3) economic, with 827 columns, including applied economics, commercial geography, and insurance; (4) social, with 433 columns, including public health and sociology; (5) scientific, with 320 columns, including physical geography, agriculture, and applied science.

TABLE I. NUMBER OF COLUMNS DEVOTED TO TOPICS IN 52 COPIES OF THE "INDEPENDENT"

Topics	Columns
Modern Political History	583
Economics	462
Civics and Politics	410
Sociology	325
Fiction	292
Education	260
Biography (Articles about People)	204
Fine Arts	196
Commercial Geography	190
Insurance	175
Religion	167
Science	115
Physical Geography	111
Public Health	108
Agriculture	94
Ethics	90
Poetry	77
Humor	51
Total	3,910

It is a matter of practical value to know the relative amount of attention paid by the American weeklies to matters of cultural interest compared with the amount of attention paid to topics of a political and business nature. We find in this particular case that 1,820 columns were devoted to politics and business and 1,288 columns to matters of a cultural nature. Other interesting comparisons can be made as to the amount of attention paid to public health and business, sociology and politics, education and religion.

The four classifications, modern political history, economics, civics, and sociology, show the history teacher his duty and opportunity. History should be made a thing of the present and not a fossil of the past. The textbook will serve only as a reference outline and current literature should afford a large part of the reading in these subjects. The subject matter will thereby bear more directly on the problems which the student is likely to meet.

The work of the English teacher would cover the fields of fiction, articles about people, poetry, and humor, and touch upon other topics. Why should not the English teacher also find much of her material for these subjects in current literature? The magazines constitute much the greater part of the average individual's reading after leaving school. It would seem to be the work of the English teacher to show what was good and bad in this material, to teach the student how to use it, and at the same time make him alert to contemporary life.

The work of the science teacher should be to give the student the necessary foundation and a glimpse of the various fields in order that he may read current

scientific literature intelligently and with pleasure. In this the teacher should also guide the pupil to what is worth while and call attention to the more authoritative periodicals. For many otherwise intelligent readers scientific topics are more or less of a mystery.

A survey of this type is the best means of enabling curriculum makers to secure a basis for the selection of subject matter which deals with live social issues of present or near-future value to the pupil and those that promise to be of value when the pupil becomes an adult. One good standard for judging any curriculum is the extent to which it acquaints the pupil with leading interests in present social life.

In conclusion I again quote from Professor Smith: "The socialized curriculum must include the knowledge areas that provide the facts and principles which lay the foundations of efficiency in all realms of society, but those areas upon which greatest emphasis should be placed must be determined by public demand as shown by the social survey."

W. D. ARMENTROUT

Colorado State Teachers College,
Greeley, Colorado

National Association of Directors of Educational Research

(E. J. Ashbaugh, *Secretary and Editor*)

ANOTHER STEP FORWARD

All members of the National Association of Directors of Educational Research who were not at the annual meeting at Atlantic City and all readers of this Journal who thereby show themselves to be interested in the scientific study of education will be interested in the step made by the association in restating its basis for membership. The association was originated to encourage the establishment of bureaus of educational research and to promote that type of research which has for its purpose the improvement of school efficiency. It has served this purpose well as the growth of its membership, the interest in its public programs, and the inquiries which have come to its secretary abundantly attest.

But this year, those attending the annual meeting felt that the time was ripe for a forward step and the following article was substituted for the old article on membership.

MEMBERSHIP

Membership in this association shall be of two classes—Honorary and Active.

Honorary: The honorary membership shall consist of those individuals who have distinguished themselves in the field of educational research whom the association may honor itself by election to this type of membership.

Active: The active membership shall consist of those persons who may be elected by the executive committee, or by the association after the consideration of their qualifications by the executive committee, on the presentation of satisfactory evidence in the form of published or unpublished studies which show ability to arrange, to organize, and to conduct research investigations and experimentations.

Thus our association becomes the first and only association which places ability in educational research, attested by the submission of evidence of work already done, as the qualification for membership. The National Society for the Study of Education and the National Society of College Teachers of Education are both notable organizations, having among their members many of the best workers in educational research in our country, but they have not required that applicants for membership should present evidence of ability in this line.

Those who sponsored the change presented the following argument which made instant appeal to the members present. The movement for careful scientific educational research is already well under way in universities, colleges, normal schools, state departments, and city school systems. The present need is not so much to foster the establishment of new bureaus, though that remains as one of the purposes of the association, as it is to unify the research activities of the workers all over the country and to bring together for mutual help and encouragement those who are

originating, organizing and directing educational investigations and experimentations. In other words, the association felt that its own needs and the needs of those who, while not in organized bureaus of research, were doing work of real value were identical.

The executive committee who must pass upon the credentials submitted, faces the new situation with both hope and fear. It hopes that the appeal for membership which the association thus frankly makes will be met with a hearty response from the best workers who have hitherto been ineligible. It fears that some applications may come from those who have done one piece of research of perhaps fair or even excellent quality but who have since been resting contented with whatever impetus that one piece may have given them. It hopes that the present membership will scan carefully not only the past but also the present work of those whom they may recommend for consideration. It is ambitious that our association shall have the largest proportion of live, growing, producing educational workers of any association anywhere.

Hence, to the present membership there comes a definite challenge. Find and recommend to the executive committee those who not only have produced and are producing but who will continue to produce. And prove your own eligibilty to continued membership. Let the new year be one of definite growth for each of us. Plan definitely some constructive piece of work which can be finished and reported within the next twelve months. Test your ability for original thinking. Submit yourself to stern criticism. Determine that you will meet to some degree, to a degree worthy of yourself, the demands of this new STEP FORWARD.

Last year in this issue of the JOURNAL the complete membership of our association was printed. It consisted of seventy-seven names, of which six were those of honorary members. The new list, complete according to the records of the secretary on April 1, consists of one hundred one names, of which ten are honorary. The following have resigned during the past year, due in all cases to a change in occupation: W. Randolph Burgess, C. A. Carney, F. S. Shapleigh.

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